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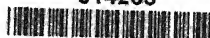
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The African Coast Fever Committee of Enquiry.



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Editorial.

THE AFRICAN COAST FEVER ENQUIRY.—Before this Journal is published the Report of the Committee of Enquiry in respect of African Coast Fever will have been published, and received the attention of all interested.

The Committee is certainly to be complimented on the very thorough and painstaking way in which it has performed its task.

Neither time nor trouble has been spared to obtain the views of all interested. That the final recommendations will not tally with the wishes of many is only natural, when such diverse interests are concerned and such divergent views entertained.

The publication of the Report cannot fail to do much to educate the public as to the nature of the disease and the methods of eradication, and to allay anxiety on the subject,

It is hardly possible for a Committee such as this one to make anything but general recommendations, to lay down guiding principles, and it would be unreasonable to look for specific and detailed regulations to meet every conceivable case that may arise.

The result of an enquiry conducted so ably and thoroughly cannot but be to the benefit of the community, and must prove of far reaching and permanent good to the pastoral industry and to the mining, mercantile and transport interests, which are closely connected with the subject.

JOHANNESBURG MAIZE AND CITRUS SHOW.—This Show, open to the whole of South Africa, was held in Johannesburg on the 27th July and proved an entire success. The exhibits were numerous and of high quality. The grand championship was won by Mr. S. J. Moon, of Natal, whose awards included one championship, one special, nine firsts, one second and one third. Rhodesia, though represented by only three exhibitors, obtained very high distinctions, Mr. T. Shillington being awarded two section championships and three first prizes for his Boone County, which formed so noticeable an exhibit on the Salisbury Show. Mr. D. Templeton obtained first prize for 12-row Hickory King or Hickory Horsetooth, and Mr. H. Kirkman was awarded second prize for Salisbury White.

These successes very clearly indicate that we have in Rhodesia the necessary nucleus for providing ourselves with seed maize of the highest quality. The farmer who can place ears such as these on a show—and there are many others who, would they but take the trouble, might do so—has the material ready to hand for establishing reliable seed plots wherewith to grow seed both for himself and for his neighbours. The complaint is frequently heard that with reduced prices the profits of maize growing are not sufficiently enticing, but how many Rhodesian farmers are applying their best efforts to improve the quality of their seed, and thereby their returns per acre? The inauguration of the Johannesburg Maize Show demonstrates how great importance is attached to this side of maize production.

RAILWAY RATES FOR GRAIN.—The action of the Railway Companies in reducing the rates on mealies, and on the native grains, such as kafir corn, rapoko, munga, etc., will give very general satisfaction. Various anomalies in the rates have been removed, and charges fixed, which give reasonable opportunity for locally produced grain to supply local wants, or at least to compete on fair terms with grain grown under admittedly cheaper conditions in neighbouring states. It is felt now that a reasonable freight rate has been granted, and with some certainty of its continuance for a couple of seasons. Farmers are therefore reassured that there is a fair prospect of a sale for whatever in that line they can grow.

At the same time the special facilities for over-sea exports are to be maintained, though, owing to unavoidable circumstances, at an inclusive charge from any station of 3s. per bag instead of 2s. 9d. as formerly. In view of the very satisfactory returns from the crops reaped and now for the most part shelled, it is quite likely that advantage will again be taken of this method of disposing of our surplus. European prices have of late dropped to a little over 9s. per bag, of which 3s. for carriage is a serious consideration, but for the best qualities somewhat more is given, and it is only our best samples which ought to be exported. It is some satisfaction to know that whatever is the world's market price, the best Rhodesian maize will command top figures.

The following is a copy of the notice giving details of the new rates for maize and kafir grain:—

Commencing 1st September, 1910, and until further notice, the temporary special rates for grain and meal conveyed to Distributing Centres, *vide* page 97 of Tariff Book, will be cancelled and the following reduced rates will operate for locally-grown Maize and Kafir Grain conveyed, in either direction, between all stations and sidings on the lines indicated below in consignments of five tons and upwards:—

Beira-Salisbury Line and Lomagunda Branch—One-fourth 3rd class
“Inwards” Rate.

Salisbury-Broken Hill Line, West Nicholson and Selukwe Branches—
One penny per ton per mile.

Blinkwater Branch—One and a halfpenny per ton per mile.

These rates will operate from point to point only, i.e., they will not include handling such as the loading and unloading of trucks, which must be performed by, or at the expense of the senders and consignees.

Meal and ground or crushed mealies will not come under this reduction, but will continue to be charged in accordance with the Local Produce Rates given on page 94 of Tariff Book.

The foregoing arrangements are in addition to, and will not interfere with the Special Export Rates for grain.

For further particulars apply to the Traffic Manager, Bulawayo, the District Traffic Superintendents, Salisbury or Beira, or to the undersigned.

C. WIBBERLEY,
Manager.

ACCLIMATISATION AND GALL-SICKNESS.—The attention of our readers is directed to Mr. Bevan's interesting notes on the Bovine Plasmoses of Southern Rhodesia. Great advances have been made during the last few years towards the elucidation of many local diseases generally grouped under the term gall-sickness, and it is clear from laboratory investigation and clinical observation in the field, that Redwater alone is not wholly responsible for the heavy loss which occurs in recently imported cattle.

It is intended to apply the process indicated in this article to the cattle shortly to be imported for the Government Stud Farm, thereby greatly increasing the prospect of their surviving when exposed to the natural infection through ticks on the veld. On arrival all stock will be subjected to artificial inoculation, and treated as was the animal referred to in Mr. Bevan's article. After recovery, and when thoroughly acclimatised, the bulls may be distributed with a reasonable prospect of their surviving, and thriving under ordinary farm conditions.

COOPER'S CATTLE SPRAYING MACHINE.—The Department has obtained from the manufacturers, Messrs. Cooper & Nephews, the well-known cattle and sheep dip firm, one of their new Cattle Spraying Machines, and intends erecting this at the Agricultural Laboratory in order to thoroughly test its usefulness.

The machine is made of galvanised iron and a framework of pipes and is twelve feet long; the cattle walk through and during the passage are subjected to a spray of dip from innumerable jets fixed in the pipes. The dip is pumped into

the pipes from a tank by a double acting force pump and what escapes from the cattle passes back into the tank through fine strainers.

The cost of the machine complete is £45 nett at East London, and the manufacturers state that once cattle get accustomed to it, as many as 600 per hour can be effectively treated. We hope in our next issue to give readers of the *Journal* our views on the utility of this machine.

THE TOBACCO INDUSTRY.—The recently formed Tobacco Planters' Association is already making its influence for good felt. A series of meetings and conferences have of late been held and many misunderstandings as to the aims and actions of buyers and manufacturers, particularly of the newly formed Tobacco Company of Rhodesia and South Africa, Ltd., have been cleared away. Rumours have been rife as to the formation of rings and monopolies, and the restriction of free sale of leaf through malignant influences. At a public meeting held in Salisbury in September, these ideas were very satisfactorily dissipated, and a working understanding arrived at that all available leaf will be brought together for a sale by auction to be held probably in January. This will give all buyers an equal chance of examining the tobacco prior to the sale, and of competing for it on level terms which is all they and the growers can possibly desire. A stimulus to planting for the following season has also been given, indeed from the number of farmers who are now thinking of taking up tobacco it is quite likely that a considerable quantity of less skilfully treated leaf will soon begin to appear. Tobacco growing and curing is an art which has to be learnt and experience is the best school; other people's experience is valuable, but one's own is best though often dearly bought.

There is much talk of undertakings on the part of buyers to abstain from purchasing by private bargain. Another aspect of this question is the possibility of all members of the Tobacco Planters' Association agreeing not to sell out of hand, but to dispose of any leaf only through the medium of the public auction. No such obligation appears, as yet, to have been entered into, but it seems worth considering whether it would not be in the interest of all growers to

secure such a combination, and thereby assure the success of the auction sale. The sale of leaf by private treaty, if indulged in freely, is liable to render abortive the whole system now agreed upon, which deserves a fair trial, as being an honest attempt to meet the requirements of buyers and producers, and to establish firmly one of our most promising agricultural industries.

FENCING LOANS FOR FARMERS.—To meet the wishes of those who desire to make paddocks within their farms or divisional fences, as occasionally happens, an important modification has been made in the terms of the loans offered by the Government to farmers for the purchase of fencing material. In future, loans may be granted for internal fencing, as well as for boundary fencing as heretofore. This change is calculated to be of service where the farms are large and small camps are wanted in connexion with the handling of cattle in big mobs; also where the Fencing Ordinance is not yet in force, and where, consequently, the advantage of the boundary fence is not so great.

The details of the conditions under which these loans are granted will be found in our Departmental Notices. It is hoped that this alteration will render yet more effective and far-reaching, the advantages of the system of Government loans for fencing purposes. In this connexion it should be clearly understood that the Fencing Loans Board exercises discretionary powers in the distribution of the sums at its disposal, and that preference will be shown to cases where the erection of the fences is calculated to be of greatest public advantage.

CATTLE EXPORTATION.—It has been officially intimated that the importation of cattle into British East Africa from the Union of South Africa and from Rhodesia is prohibited.

THE DAIRY EXPERT'S VISIT.—Miss Maidment's brief tour has been successfully completed. During the course of a few weeks, lectures and demonstrations were given at thirteen widely separated centres to highly appreciative audiences,

some of the best attended meetings being held in the most remote parts.

While it is perhaps too much to say that all the mysteries of cheese and butter have been taught to those who attended, yet, assuredly, many useful hints were picked up, and many individuals have learnt to improve their ways. The manufacture of cheese is a somewhat intricate process, only to be acquired by doing it oneself under skilled direction, while the art of butter making lies more in adapting procedure to the daily changing conditions of the cream, the temperature and accidents of place, than in the mere routine of the process. How to produce an unchanging sample of butter under changing and often unfavourable conditions, is only to be learned by practice and in course of time.

An interest in the possibilities, and the realisation of the practicability of scientific methods has been aroused by Miss Maidment's visit, which should be of great value in fostering our dairy industry—as yet in its very early stages of development.

Miss Maidment speaks with confidence of the dairying possibilities of the country, and finds conditions by no means so antagonistic to good butter making as many people suppose. Her advice will be taken by many who attended the lectures, and the public may look for a supply of cream cheeses, *alias* Rhodesian Cheese de Luxe, and of Rhodesian Wensleydales at an early date.

KHAKI AND OTHER WEEDS.—Now is the time for the farmer to be on the look out for the appearance of weeds of a noxious nature, not only in his lands, at his kraals, and along his roads, but also on public roads and outspans, at railway stations, and along the permanent way. The railway authorities have in the past been active in the suppression of weeds, realising the great ease with which they may be introduced and spread from sidings and along the track, and how much may be done by prompt eradication to prevent widespread dissemination of burr-weed, Mexican poppy, and the like. It is not everyone who knows these pests by head-mark, so it is incumbent upon those who do, to bring them to the notice of those concerned. Where uncertainty exists

specimens, with particulars, should be sent to the Botanist, Department of Agriculture, Salisbury.

NATIVE LABOUR.—The shortage of farm labour is causing much inconvenience all over the country, and the prospects for the future are serious. Local labour appears to be coming out less readily than heretofore, and is as a rule only obtainable for brief and broken periods and cannot be relied upon, while the demand is rapidly increasing. The contract period for large numbers of Nyasa boys will soon terminate. The outlook is assuredly grave, for labour, poor though it often is, is essential to the development of our farms and for the simple operations of the field. It is the newcomer who particularly suffers; the old established farmer usually has a reputation with the natives, and has himself to thank if he cannot get voluntary labour.

Whatever the immediate future has in store there can be no doubt that the introduction of labour-saving methods and devices will be one of the most urgent needs, and will bring about the most prominent development of agriculture in this country during the next few years.

FARMERS' ASSOCIATIONS.—Again we are glad to hear of the formation of a new Farmers' Association, this time at Headlands, in the Makoni district. The President is Mr. R. le S. Fischer, and the Secretary Mr. H. Barnes Pope of The Springs.

Farmers are realising more and more the value of co-operation for all purposes, and as the country fills up new centres form themselves, where farmers meet together for the discussion of matters of local interest and for mutual instruction. These Associations form a valuable link between the individual in remote districts and the Administration, particularly the Department most concerned with the interests of Agriculture. There is a prospect of another Association being formed also at Marula, Matabeleland, at an early date,

Report of the Committee of Enquiry in respect of the Cattle Disease known as East Coast Fever.

*To His Honour Sir William Milton, K.C.M.G.,
Administrator of Southern Rhodesia.*

May it Please your Honour,

We, the undersigned, members of the Committee appointed by your Honour, under Government Notice No. 159 of the 30th June, 1910, for the purpose of investigating and enquiring into the cause of the periodical outbreaks of the cattle disease known as East Coast Fever, and the questions of movement of cattle, ox transport, fencing and the management of Commonages as related to such outbreaks, and for generally considering measures for the prevention of such disease, have the honour to submit herewith our Report.

Our first meeting was held in Salisbury on 4th July, and, in addition to further meetings at this centre, the following places were visited: Mazoe, Marandellas, Umtali, Gatooma, Gwelo, Umvuma, Felixburg, Victoria, Selukwe, Essexvale and Bulawayo. General notice of our visit to each centre was given through the Press or otherwise, and special notice was sent to the Chambers of Mines, Farmers' and Small Workers' Associations.

In all, 125 witnesses appeared to give evidence in their individual capacities, in addition to which there were a number of deputations representative of associations of miners and farmers throughout the country. We also received several communications from individuals who were unable to appear personally. Dr. Lichtenfeld, the head of the Veterinary Department of German East Africa, who was visiting this country, kindly consented to attend one of our meetings, and gave valuable information, the result of wide experience in dealing with Coast Fever in East Africa.

On the whole, we are satisfied with the response to our invitation to give evidence on the subject of our enquiry, and

are of opinion that the various questions embraced in the terms of our reference have been well ventilated.

It may be mentioned at the outset of our Report that the official designation in Rhodesia of the disease, the subject of our enquiry, is African Coast Fever; but, as the name East Coast Fever was adopted in the Resolution of the Legislative Council recommending the appointment of this Committee, and in the subsequent Government Notice giving effect to that Resolution, the term has been adhered to throughout our proceedings, unless where the shorter title, Coast Fever, is adopted.

Our report deals, under five different headings, with the subjects specially referred to us, while several general matters are dealt with under a sixth. Appended will be found a brief history of Coast Fever in Rhodesia, prepared by Mr. Sinclair, the Chief Veterinary Surgeon. The present position, as gathered from this statement, is eminently reassuring.

1. The causes of the periodical and widely distributed cases of outbreak of East Coast Fever.—In order to understand how outbreaks of disease may occur in widely separated localities and to appreciate the means adopted in dealing with such outbreaks, it may not be out of place to refer, in a general way, to the scientific aspect of the disease.

Coast Fever is a disease peculiar to bovines, and its immediate cause is a special blood parasite found in the blood of diseased animals at an advanced stage of infection. The disease is not immediately contagious, and the presence of infected animals in a clean herd would be no source of danger if there were no agent present capable of conveying the causal blood parasites from the diseased to the healthy cattle; so far scientific investigation has succeeded in establishing the tick—chiefly the brown tick—as the only agent capable of spreading infection.

In order that a tick may be capable of carrying infection it is necessary that it should, either in its larval or nymphal stage, have fed on the blood of an infected animal at a time when the parasites of disease had appeared in the blood. Having so fed, it becomes an immediate source of danger to any healthy bovine to which it may subsequently attach itself. It may be stated here that the infecting agent in Coast

Fever does not, as in the case of Redwater, pass through the egg of the tick to the second generation.

The following typical instance of the incubation and development of Coast Fever is given with a view to a clear understanding of the subject and of the methods recommended for combating the spread of the disease. In a case, illustrated in the annexed diagram, infective ticks, that is ticks that had engorged on the blood of a diseased animal at a stage in the disease when the peculiar parasites had appeared, were transferred to a healthy cow, on the blood of which they fed: for twelve days thereafter there was no indication of disease; on the thirteenth day the temperature, the first manifestation of disease, commenced to rise, and peculiar bodies, known as Kock's granules, appeared in the spleen and glands; on the twentieth day the disease parasites commenced to appear in the blood and continued to increase in numbers until the death of the animal on the twenty-ninth day.

It will be seen from what has been said of the peculiar features of the disease, as illustrated by the foregoing typical case, that it is quite possible for an animal to become infected at one locality and travel for a period of twenty days or thereabouts before it is capable of transmitting disease, through the agency of ticks, to another clean area. This serves to explain cases of outbreak at widely separated points, with no occurrence of disease along the route of transmission; incidentally it also illustrates the reason and desirability of destroying animals on a rise of temperature, a symptom which occurs before the appearance of the blood parasites, the only source of danger. This question of destruction will, however, be treated of under a separate heading.

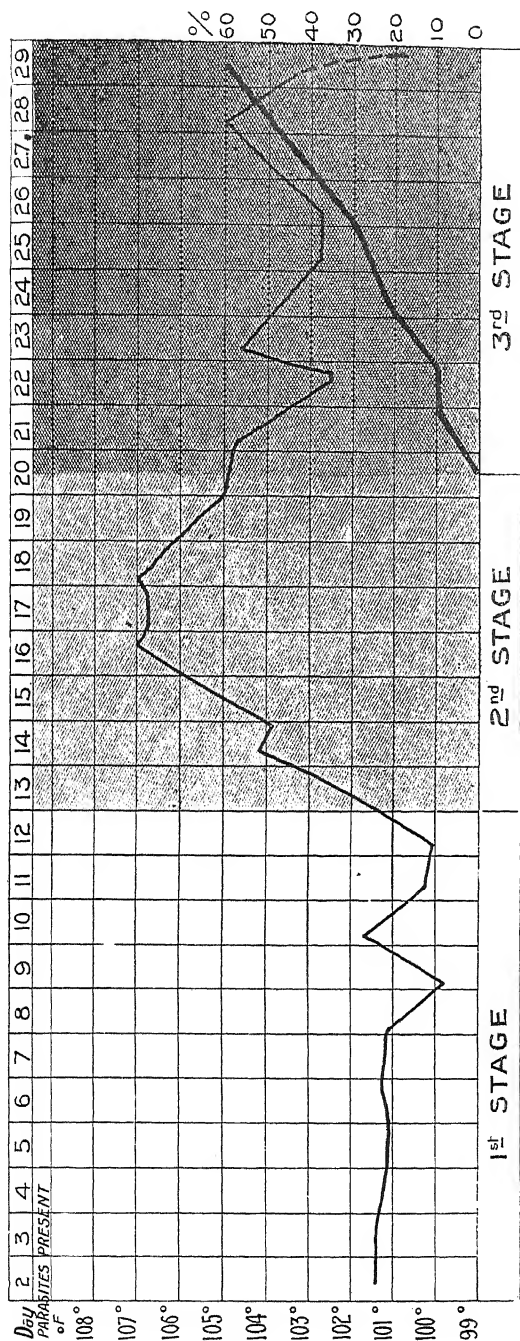
With regard to outbreaks of disease at widely separated points in this country during the past few years, they can be accounted for, theoretically, by the usual cause; that is, the movement of diseased cattle from infected to clean areas. In the course of our investigations we have taken pains to establish a connection between the seat of recent outbreaks and the movement thereto of cattle, diseased or likely to be diseased, but we have failed to establish this connection in a single instance. Although this is so, we are not, on the other hand, prepared to say that such movement may not

have taken place and have been accountable for at least one outbreak, namely, that near Essexvale. A strong presumption has been raised that the disease was conveyed thither by illicit importations of diseased cattle from beyond this Territory on its southern boundary. There is the direct evidence of reliable witnesses, that cattle have been conveyed from Gwanda to stations farther north, which came from places across the border. This is amply supported by a comparison of the number of cattle normally belonging to the Tuli-Gwanda district and the number which, according to removal permits, have been sent out of it. The total number of cattle in the Tuli district has been placed by the native officials at approximately 5,500, whereas the records of the Department of Agriculture shew that permits were issued for over 3,000 head of slaughter cattle to leave the district during a period of eighteen months. Assuming the estimate of the Native Department to be doubled, the slaughter cattle exported would still be quite out of proportion to the total number in the district. There were a few legal importations which hardly affect the question.

We are, therefore, forced to conclude that a large number of cattle have been introduced illegally into the Tuli-Gwanda district from points across the border, and that the outbreak of disease at Essexvale may be attributable to such importations. Many cattle for slaughter purposes were also shipped as far north as Salisbury, prior to the outbreak of disease at the latter place; and it is possible, but not very probable, that this outbreak had its origin in these cattle.

It having been found impossible to trace recent cases of disease to the usual cause, namely, transmission by ticks dropped directly from infected animals, consideration was given to several other theories advanced to account for these outbreaks. The conveyance of infective ticks in railway trucks, on the bodies of other animals and birds, on the clothing of human beings, and even their malicious distribution, was considered. We admit the theoretic possibility of transmission of disease by these means, but it does not appear very probable. Even if disease is likely to be transmitted by these agencies, it seems almost impossible to devise means for the combating of some of them. It is important to remember in this connection that an infective tick, having once fed on a mule, dog, or other animal, at once loses its infection.

Characteristic Chart of African Coast Fever.



The chart shows the body temperature of a cow infected in England by ticks sent from South Africa.

The thin black line indicates the temperature record.

The rise in the percentage of infected red-blood-cells is indicated by the heavy black line.

Stage 1.—The period of incubation.

Stage 2.—The period when the temperature is elevated but the parasites are not present in the peripheral blood. Koch's granules may be found in the spleen and glands.

Stage 3.—The period when the parasites are present in the peripheral blood.

It has been seriously suggested by responsible witnesses that what are generally termed "salted" cattle, that is, cattle which have contracted the disease and recovered, may, at a subsequent period, lose their immunity and become sources of infection. This theory does not rest on a scientific basis and cannot be accepted; even if it were true, it is almost impossible to get evidence of one well-authenticated case of an animal which has actually recovered from the disease, although it has been stated by a few witnesses that isolated cases of such recovery exist. The survivors from diseased herds appear to be beasts which possessed a natural immunity.

In conclusion, we are of opinion that serious consideration need not be given to anything but the usually accepted method of the transmission of disease, and that practical results will only be attained by efforts directed to the prevention of such transmission.

2. *The question of movement of cattle, ox transport, and what restrictions, if any, should be made, either temporarily or permanently, or locally or generally.*—The following remarks naturally apply to areas outside centres of actual infection only.

Subject to certain observations regarding the machinery for carrying out the law, and to specific recommendations as to imported and traders' cattle, we are of opinion that the existing Regulations as to the movement of cattle for *bona fide* farming, breeding, mining, dairy, slaughter, and grazing purposes are adequate on the whole, and in the best interests of the country.

The question of ox transport is not so easily disposed of. It is a subject on which much diversity of opinion prevails, a position assignable to the conflicting interests of various sections of the community and the difference in local conditions throughout the country.

The trek ox is generally regarded as a source of danger and the chief instrument in conveying disease, hence there is one section of the community which advocates the total abolition of the working ox except within the boundaries of a farm or similar small areas. Another, and much larger, section, while quite alive to the danger of unrestricted ox transport, regards the working ox as essential to the country. With the latter opinion we agree.

One result of our visits to various parts of the country is the firm conviction that nothing but oxen could meet the transport requirements of many districts. The mule and the donkey are the substitutes usually proposed, but in many places the nature of the country and the state of the roads, more particularly in the wet season, render the employment of mules and donkeys impossible. Even if they could cope with the work, the mortality amongst them is so great that only a few could afford to employ them. Mules are very subject to horse-sickness, and the mortality among imported donkeys, other than the small inferior kind from East Africa, is excessive.

In short, the total abolition of ox transport would entail the wholesale curtailment or closing down of farming, mining, and other industrial operations in many parts of the country, and result in a serious loss to the whole community.

The ox appears to be the natural means of transport under local conditions. The substitutes proposed are unsuitable and beyond the reach of many, and to procure such substitutes would result in many thousands of pounds being sent out of the country. We are of opinion that if but a portion of this sum is devoted to the provision of dipping tanks, fencing, and the regulation of movements, ox transport may be allowed under such conditions as will be of but little menace to the cattle industry of the country.

General opinion, apart from that which advocates total abolition, favours some sort of restriction being placed on ox transport. There is a strong feeling that movements should be confined to districts, the native districts being used as units. The object is to prevent oven travelling over long distances, and coming into contact with other cattle which may also have come from distant parts. The end desired commends itself, and we recommend that ox transport be regulated by some such principle as suggested.

Approaching the consideration of district movement, however, it at once appeared that the present native districts would be quite unsuited as a basis. While recognising the desirability of confining movement to limited areas, it appears essential to provide for mines and farms having access to convenient stations and sidings. If the present native districts were adopted as units it would often happen that a farm or mine would be closed off from a station two

or three miles distant, owing to the occurrence of an intervening native boundary. In other cases it happens that one centre is a convenient outlet from places situated in different districts.

It has been suggested that new cattle districts should be created according to local conditions with a view to allowing movement within them. We are of opinion, however, that there is quite enough variety of districts already, and that, if cattle districts were formed, constant alteration of boundaries would be required to meet the case of new farms, mines and railway stations.

After carefully considering the whole question, we unhesitatingly recommend the abolition of the professional transport rider who travels over long distances in the pursuit of his business. As to other ox transport, we are of opinion that, in clean areas, farmers and miners should be afforded access to the most convenient station or siding. In providing for this outlet, the Veterinary Department would issue a permit to the applicant, fixing the town or point on the railway to which he is allowed to go. He would be confined to this one point, and, in the natural order of things, his neighbours would be confined to the same point. Persons residing at a distance from this neighbourhood would have some other convenient point of exit to which they would be confined, and the result would be that the country would be divided automatically into areas for ox transport, which would meet the convenience of the people, and avoid the danger of cattle coming together from widely separated localities.

It may be well to illustrate our proposal by a specific example. Let it be assumed that Salisbury town and the neighbouring country is free from disease: it is desired to give miners and farmers reasonable access to markets by means of ox transport, and, at the same time, to prevent oxen travelling over long distances and meeting at a common centre. Under our proposal, persons residing immediately around the town would get permits to travel to it; others, outside the immediate Salisbury radius, would be allowed access to points on the Beira, Bulawayo, and Lomagundi lines, and, pending the advent of a more convenient railway, Mazoe residents would be allowed access to a point on the Lomagundi branch, and Enterprise or Abercorn residents

would go to a convenient siding on the Beira line. A person, having one point of access fixed, would not be allowed to travel to another, unless the construction of a new railway, or the building of a more convenient station or siding, or other similar good reason justified it.

As to working from farm to farm, this should be allowed where such farms are part of a group, having a common outlet to a town or railway.

In addition to this form of ox transport, there appears no objection to the working of oxen within a suitable area around mines.

Working of cattle to the extent recommended should only be allowed under permit, and a penalty should be imposed upon persons found with tick-infested oxen on public roads—"tick-infested" meaning cattle that are not reasonably free from ticks. The indirect result of this would be that persons using oxen on roads would have them regularly sprayed or dipped. To guard against undue hardship, it might be provided that a good defence to a charge of having tick-infested cattle would be an official certificate that the animals had been dipped within such recent date as may be fixed by Regulation. Vehicles drawn by oxen on the public road should bear the owners' names.

The foregoing are our views with regard to ox transport generally, and, while we are of opinion that it should not be allowed under less stringent conditions, there appears no objection to a particular district deciding, by a resolution of, say, a two-thirds majority, that ox transport shall be entirely abolished. Put to this test, we believe it would be terminated in the Umtali native district, and probably in Melssetter. We suggest the desirability of having the matter decided in these districts by local option.

The position of the area embraced in the greater portion of the magisterial district of Victoria is different from that obtaining in the rest of the country. There is comparatively little mining or farming, and the chief wealth of the district consists in cattle, mainly the property of natives; but they furnish, indirectly, the chief source of income to the small European population. Local opinion as to what extent movement of cattle should be permitted is somewhat divided; but all are quite agreed that there should be freedom to export cattle, and some go so far as to recommend that no

cattle should be introduced for any purpose whatsoever. The weight of opinion is against the allowing of ox transport to the railway at Umvuma, which entails moving to and fro across the border and contact with cattle from other districts at the rail head.

After a full consideration of the peculiar local conditions, we see no reason why there should be any restraint on the output of stock in the present clean state of the district, beyond what is suggested later for the control of traders' cattle. Ox transport within the district should be allowed under permit as at present, subject to what has been recommended regarding keeping cattle working on public roads free from ticks. The question of working cattle across the border, as at present allowed, deserves special consideration. The whole welfare of the district is so essentially dependent upon cattle that much is to be said in favour of the total suspension of extra-district ox transport; but this we do not recommend if, as appears quite possible, Iron Mine Hill or some other suitable point on the Blinkwater Railway, could be fixed as a place to which ox wagons from the Victoria district, and that district alone, could go.

In view of the great interests at stake, no cattle, except a superior class of animals for breeding purposes, should be introduced into the Victoria district.

3. *The question of compulsory and voluntary fencing of public and private lands.*—The value of fencing as an instrument in controlling the spread of disease is generally admitted, but the time does not appear to be ripe for instituting a general measure of compulsory fencing.

As regards the fencing of public lands, some go so far as to advocate the fencing of all main roads, outspans, native reserves, commonages and railways. This may commend itself as an ideal to be aimed at, but we fear it is far from practicable. As an instrument in controlling disease, the cost would be entirely out of proportion to the result likely to be obtained. Our recommendations under present conditions are confined to advocating the fencing of commonages, quarantine or infected areas, and public outspans where situated amongst occupied farms. The fencing of railways, if it could be arranged, would be most desirable. Private fencing should be encouraged, but not made compulsory.

The assistance at present offered by the Government towards private fencing appears adequate in the case of an ordinary 1,500 morgen farm; but, for the purpose of larger farms, the advance given might be in proportion to the area to be fenced; provided always that the security offered is sufficient.

It would appear that there are certain respects in which the present Fencing Ordinance might be improved. In order to bring Part I. of the Ordinance into operation in any area, it is necessary to get the approval of a two-thirds majority of resident landowners, irrespective of the extent of their holdings. It is suggested that it would be more equitable to decide the matter in a manner which would take account of the area represented by the persons voting.

Further, the position of the British South Africa Company's land, and land held under Permit of Occupation, does not appear to be satisfactory in matters of fencing. It is thought that if the will of any locality, as represented by the extent of holdings, is in favour of applying the Ordinance, then the British South Africa Company should bear its proportion of the expense, charging the cost, whenever the land is alienated, to the purchaser.

We are advised that the insisting on the insertion of the general clause in mortgage bonds in respect of loans is an obstacle to fencing, and that the rates of fencing material over the Rhodesian Railways are excessive, as compared with those obtaining on the Cape system. We strongly recommend that security be not insisted upon beyond what is actually necessary, and that an endeavour be made to approximate the rates on material to those obtaining in the South.

4. The management of commonages, in respect of the use and retention of horned cattle thereon.—Commonages have in the past been rightly regarded a danger in originating and disseminating disease. They have been distributing centres and the points where the cattle of the transport rider, the farmer and the speculator came into contact and thereafter spread far and wide throughout the country.

If our general recommendations regarding ox transport are adopted, the number of working cattle coming together on the commonages would not be great, consisting merely of those coming from a defined area around the towns. It is

further suggested that such animals should not be allowed to remain on the commonages longer than is absolutely necessary.

It often happens that cattle of traders and speculators are allowed to run on commonages for an indefinite period and are subject to but little restriction. It does not seem desirable to prohibit cattle sales, absolutely, in towns, but it is recommended that special areas should be set aside for the reception of the cattle of traders and others intended for sale, and that the retention of such cattle on commonages for indefinite periods should either be entirely forbidden or discouraged by the imposition of grazing fees which would increase in proportion to the period of detention.

For the convenience of the community, it is thought that residents should be allowed to keep a few head of cattle for private milk supplies, but persons who run cattle on commonages for speculative purposes or professional dairying should be required to pay grazing fees, which might be appropriated to fencing off areas to be used for dairying, transport, slaughter and other purposes, respectively.

It has already been recommended that all commonages be fenced, and we consider it as of equal, if not greater, importance that all cattle thereon be kept free from ticks by regular and compulsory dipping.

5. *The question of measures, local and general, for the prevention of the disease.*—If it is assumed that the movement of cattle inside the country is permitted to the extent recommended in this Report, the most important precaution against disease will be the strictest observance of the regulations governing such movement.

It may be stated generally that the existing regulations do not leave much room for improvement in form, but the machinery for carrying them out is very defective. For example, the principle of allowing movements, under permits only, is excellent, but in districts reasonably supposed to be free from disease it has degenerated into a mere form. Again, it has been wisely provided that certain movements shall be preceded by dipping or spraying, but it would appear that this regulation has often either been disregarded altogether or evaded by perfunctory spraying—quite insufficient for the purpose intended. Further, the provisions for branding and killing cattle intended for slaughter purposes

have not been observed, especially at small centres. This is a point of great importance in the case of slaughter cattle from outside the territory, and we definitely recommend that the introduction of such animals be permitted to such centres only as have properly fenced quarantine areas, and where the regulations regarding beasts for slaughter can be supervised and carried out to the letter. These observations are not intended to condemn the officials charged with carrying out the regulations with neglect—the position is almost entirely, if not altogether, attributable to the defective machinery and to there being too few men for the work.

The number of Cattle Inspectors is not great enough for the requirements of the country, and such as there are have been confined to their offices issuing permits in respect of cattle which they rarely see. We are of opinion that there should be enough Inspectors to permit of regular visits to all herds of cattle at intervals of not more than two months, and such officers should be entirely relieved of clerical duties. The issuing of permits, beyond what the Inspector would issue in his tours, might well be assigned to a clerk on the staff of a district office, who would act on the general instructions of the travelling Inspector.

Notwithstanding the small number of Cattle Inspectors, and the system which has confined them too much to their offices, they have, in many cases, done very good work. A serious consideration of the whole question has, however, led us to recommend a radical change in the nature of these appointments. The importance of the cattle industry to this country is so great that we have no hesitation in recommending a large expenditure in any direction calculated to ensure its well-being. We consider it essential that the country should be well supplied with men scientifically trained in stock diseases, and recommend that Veterinary Surgeons be appointed to take charge of districts and gradually replace the Cattle Inspectors. It may be urged that Veterinary Surgeons unversed in the conditions of the country will be unsatisfactory. We are of opinion that this defect will soon disappear, provided the salaries and standing are such as to induce competent men to accept the appointments, and make their homes in the country. Speaking in relation to the subject of this enquiry only, we consider our recommendation is amply justified; but, apart from this, it is hard to estimate the benefit likely to result from the presence of persons

qualified to deal scientifically with the numerous other stock diseases which are present or may occur.

The question of branding of cattle has been considered in relation to the checking of disease. Compulsory branding is not recommended as a general measure, but it should be insisted on in the case of transport oxen and cattle intended for slaughter, and in the case of all cattle in or near an infected area. The branding of all native stock has been considered. It is a step which might be attended with difficulties, but its gradual introduction does not appear impossible. It is satisfactory however to learn that the native, although prone to certain restricted illicit movements of stock for lobolo purposes, is not regarded as a likely agent in spreading disease. The utmost that can be recommended, in addition to the cases already mentioned, is the branding of all native cattle with a distinctive official brand in districts adjoining borders from which illicit importations are feared. On such borders Europeans should be required to brand their cattle and keep a stock register.

The destruction of ticks by dipping or spraying is a most useful aid in the prevention of disease. The time does not appear quite ripe to insist on compulsory dipping; but, as already indicated, we recommend it for all cattle on commonages; and the suggestion made as to the obligation to keep all cattle working on the public roads free from ticks would result in the cleansing of such animals either by dipping or spraying. All other movements should be preceded by cleansing from ticks. Those who are in the habit of dipping their stock regularly are unqualified in their evidence as to the value of the operation, quite apart from the consideration of checking Coast Fever; even natives who have been required to dip by the owners of the farms on which they live have not been slow to realise its advantages. The assistance given by the Government towards the erection of private dipping tanks is liberal, and should go far to make dipping almost general.

We attach great importance to the matter of dipping, and recommend that, wherever it is required by regulations, it should be strictly enforced. It appears necessary, however, that more public dipping tanks should be provided. It has been represented to us that they should be built at Kimberley Reefs, Moore's Concession, Old Umtali, Gatooma, Gwelo and

at two points in the Victoria district, for the purpose of dealing with cattle being exported. This does not exhaust the list, but it is strongly recommended that all reasonable facilities for dipping be given generally, and that, if our suggestions regarding ox transport be adopted, dipping tanks be placed at the chief outlets provided under the system.

In conclusion, we should have been pleased, if it had appeared possible, to recommend compulsory dipping throughout the country. We regret, however, that it does not appear quite practicable at the present. Should the occasion unfortunately arise for adopting more drastic measures than those recommended in this Report, then we consider that compulsory dipping or spraying should be the first step taken.

It is recommended with a view to preventing illicit movements, that any cattle-owner may ask a person travelling with cattle to exhibit a permit. We are alive to the danger of this power being abused by meddlesome people, but a penalty might be provided for exercising it unreasonably.

It has been suggested that cattle owners should keep stock registers and forward monthly transcripts, shewing increases, deaths, etc. There would be a difficulty in applying the principle to native owners, and we think it would suffice if the present law, requiring the reporting of suspicious cases of disease, were extended to compel the reporting of all deaths within a twenty mile radius of an infected area, and if provision were made for the making of stock returns by Europeans within this area and for the keeping of a census of the native cattle therein.

The movement of all hides should be prohibited, unless accompanied by a certificate that they have been thoroughly disinfected.

Notwithstanding the stopping of all movement on the outbreak of disease, clean cattle on a group of farms having a common dipping tank should be allowed to travel to it.

We are of opinion that the punishments awarded for breaches of the cattle laws and regulations are often entirely inadequate. Cases have been brought to our notice where the law has been broken deliberately, the profit to be gained thereby far exceeding any punishment to be feared. The majority of the Committee favour the assigning of a minimum penalty for offences under the Animals Diseases Ordinance

and Regulations, although it may be a matter of doubtful expediency, and, in cases, calculated to defeat the end in view. At present, cattle illicitly moved may be destroyed if considered a source of danger. We think that provision should be made for confiscating cattle moved in defiance of the law in cases where destruction is not considered necessary.

We are of opinion that native detectives or guards, similar to those formerly employed at Victoria, should be engaged for the purpose of detecting breaches of the law, especially in purely native districts and on borders where illicit importations are feared.

Speculators and traders in cattle are regarded as a source of danger. We recommend that cattle dealers be licensed, and that no licence be issued except on the recommendation of the Native Commissioner of the district in which it is proposed to carry on business. It is not suggested that a heavy fee be imposed, the object aimed at being the registration of dealers. It should be provided that any breach of the cattle laws entails forfeiture of the licence. No licence should permit trading near a border from which the introduction of disease is feared.

In districts like Victoria, the imposition of a strict period of quarantine before the removal of cattle, and the removal at fixed times, under direct official supervision, have much to commend them; yet this provision might be relaxed if traders are licensed, cattle dipped, routes fixed, and such descriptions given of them on the removal permit as will act as a restraint on changing the cattle *en route* to their destination.

It is considered desirable that all permits should, as far as possible, describe the animals to which they relate, and that the various conditions attaching thereto should be fully and legibly set out on the front.

The risk of disease from imported cattle has received consideration. There is a certain fear of infection being brought in with cattle imported from north of the Zambesi, but the existing provisions regarding certificates and quarantine should afford sufficient safeguard, provided they are rigidly carried out. It has been asserted that cattle are put into a quarantine area for a definite period, but that, before that period has elapsed, a second or third lot of animals may

also be brought into the same area and come in contact with the first. If this is so, the object of quarantine is largely defeated, and we consider that the strictest precautions should be taken to ensure effective quarantine for each herd introduced.

With the unfortunate approach of Coast Fever to the Province of the Cape of Good Hope, it is recommended that great care be exercised in respect of cattle from the South. It would be well if, in addition to the present precautions, provision could be made for the quarantine and cleansing of animals by dipping or spraying before despatch, since it appears that there is considerable risk attendant on immediate dipping on arrival. On reaching here they should be examined, and, if considered necessary, put in quarantine at the port of entry. If this can be dispensed with, then they should be quarantined at their ultimate destination. We are of opinion, however, that for the present, importations may be confined almost entirely to well-bred stock intended for the improvement of local herds.

6. *General*.—In the course of our investigations, several matters came under observation which, although not strictly referable to any of the specific heads of the enquiry, appear deserving of special notice.

It would appear that certain delays regarding fencing infected areas have occurred on the outbreak of disease, owing partly to a shortage of material, and partly to delay in making arrangements as to who should bear the cost of the fence. We are of opinion that the Government should either itself retain in stock, or provide for a contractor retaining, sufficient fencing materials to enclose an infected area as soon as the probable extent of infection has been ascertained. In order to avoid delay as to the payment for fencing, fixed rules should be laid down, which could be brought into operation without protracted negotiations. If an infected area is so situated that it would be inexpedient to observe farm boundaries in enclosing it, then the fence should be directed to prevent the spread of disease only, and the cost should be borne by the Government. If, on the other hand, the object of the fencing can be obtained reasonably by following farm boundaries, it is thought that the expense should be borne partly by the general community in whose interest it is constructed, and partly by the farmer

whose land has been enclosed. The actual cost of erection should be borne by the Government, but the farmer should be required to pay for the material, by instalments without interest. Ten annual instalments is suggested.

There can be no question as to the wisdom of stopping all movement of cattle over a wide area around the seat of an outbreak of disease, but the practice whereby it is regulated by the boundaries of native districts often results in anomalies, and even in unnecessary hardship. For example, it sometimes happens that, owing to the accident of boundaries, movement is allowed much nearer to the centre of infection in some cases than in others. Except good reason to the contrary exists, the stoppage should be for an area having, as near as practicable, a uniform radius around the danger zone.

A good deal of high feeling exists in and about the scenes of certain recent outbreaks owing to the action of the Veterinary Department directing the destruction of cattle on a rise of temperature; indeed, it has been asserted that such destruction has taken place in herds where no disease has existed, high temperatures being from other causes. We have no reason to believe in the truth of this assertion, but a good many accept it, with the probable result that there may be a tendency to conceal future outbreaks if, unfortunately, they occur. It is clear that a good deal of aversion to the destruction on temperature is owing to the misunderstanding of its importance in checking the spread of infection. It is therefore recommended that pains be taken to educate all stockowners on the subject by means of a chart similar to that appended to this report, together with all such explanations as may appear necessary. Further, great care should be taken to prove to the owner, when it becomes necessary to destroy cattle, that the disease is actually present in his herd.

The question of the wholesale destruction of herds to prevent the spread of disease, and the payment of compensation for destroyed animals, has an important bearing on our enquiry. These are matters on which it is difficult to make hard and fast recommendations. Cases will arise where, owing to the impossibility of getting clean areas into which cattle may be removed without risk to adjoining herds, the best course is wholesale destruction. In such instances,

with the disease actually present, and if there be no room for moving to a clean area, the mortality would be so high in the ordinary course that much compensation cannot be reasonably expected. On the other hand, if there is sufficient room for temperature camps, and a general spread of the disease is not likely, destruction of the whole herd, unless it is a very small one, does not appear necessary. It is suggested in this connection that powers be given to take and use any suitable clean ground for temperature camps, provided that the owner is compensated for any loss actually sustained thereby.

There is, almost always, a great lack of facilities for cleansing cattle in and around infected areas, and it is recommended that a few portable dipping tanks or sprays be kept by the Government for use in the case of outbreaks. It appears that such are now obtainable in the country.

It has been mentioned that the dipping fees at the public tanks are unreasonably high. Without being in a position to state whether this is so or not, we recommend that the matter receive consideration, and that the lowest possible scale be fixed.

The desirability of appointing advisory boards, or officers to be styled Field Cornets, for the purpose of dealing with matters relative to cattle diseases, and the movements of stock, has been advocated in several quarters. The weight of evidence appears against such appointments under normal conditions; but, in the case of an outbreak of disease, a small Local Committee might be of great assistance to the officials. It is felt, however that if our recommendation as to the appointment of a sufficient number of travelling Veterinary Officers be adopted, the desire for popular boards or officials will disappear.

Instances have been quoted where persons, furnished with a permit to move cattle from one place to another, have assumed the right to travel to their destination along practically any line they please. It should be made clear that permits give no right to trespass on private property.

The examination of the blood of infected animals being of great importance in the detection of disease, it would be desirable to instruct cattle-owners how to take smears, and to give them facilities for procuring slides for the purpose.

It is recommended that no effort be spared in making the Bacteriological Institute as efficient as possible, and that a sufficient staff be solely employed in carrying out its objects. It is further recommended that farmers and cattle-owners be quickly and thoroughly informed of all matters pertaining to their interests.

A great variety of proposals have been made to us in regard to the suppression of Coast Fever. Some of these appear too drastic, while others, although well-nigh perfect theoretically, did not seem capable of practical application. Our recommendations have been guided by the consideration of what is practicable, and we are persuaded that their adoption will be attended by success in stamping out Coast Fever, if adequate machinery for their enforcement is provided.

It has been most pleasing to notice, in the course of our enquiry, the general appreciation in which the services of the Veterinary Officers and their assistants are held. Co-operation between the officials and the community is the greatest safeguard of the country, and it is trusted that no effort will be spared to maintain the present state of good feeling.

In conclusion, we take this opportunity of thanking the numerous witnesses who have assisted us with their evidence and advice, and of recording our appreciation of the good service rendered by our Secretary, Mr. W. J. Powell.

R. MCILWAINE, Chairman.

W. B. BUCKNALL	} Members of
J. A. EDMONDS	
E. A. HULL	
J. MACK	

Committee.

APPENDIX.

HISTORY OF AFRICAN COAST FEVER.

During the latter part of 1901, a lot of cattle were shipped at Dar-es-Salaam for Beira and Delagoa Bay. It is stated that these were the balance of a large mob brought down from

the high veld in German East Africa to the coast. On the passage down it is alleged that a large number died, and that the carcasses were thrown overboard. Some were landed at Beira, and the ship went on to Delagoa Bay. Of the lot landed at Beira, several truck loads were sent by rail to Umtali, two of which went on to Salisbury. Disease broke out amongst both lots, but its true nature was not recognised.

The disease also broke out in the Transvaal. Dr. Theiler found it at Nelspruit, Herdspoort and Mooiplaatz, and Dr. Koch expressed the opinion that it was the same as that which existed in Rhodesia. In this connection he says, "There can be no doubt that the same disease exists in the Transvaal as prevails in Rhodesia, but when we take into consideration the position of the infected districts in the Transvaal and the obstacles to communication which have existed and still exist, the view that the disease extended thither from Rhodesia is, I think, quite untenable. What is very likely, however, is that the disease obtained a foothold in the Transvaal in much the same manner as in Rhodesia, that is, being imported from the coast, in the one instance from Beira, and in the other from Delagoa Bay."

I believe that the fact that cattle from an infected herd at Dar-es-Salaam having been shipped to Beira and Delagoa Bay was not known at the time of Dr. Koch's investigation in this country.

Australian Cattle.—About the end of 1900, about 1,000 head of cattle from Australia were landed at Beira for Rhodesia, and, owing to the lack of railway facilities, were kept on the Beira flats. Disease broke out amongst them, and they were sent on to Umtali; they carried the disease with them; the mortality was unchecked by the movement to the higher veld; they melted away until only three were left out of the whole shipment. The disease affecting these cattle was diagnosed as Redwater or Texas Fever. The heavy mortality is explainable, as the animals were brought from non-infected areas in Australia. There is no doubt whatever that these Australian cattle died of Redwater, pure and simple, which they contracted on the Beira flats; Coast Fever being introduced into Beira subsequent to the arrival and departure of the Australian cattle. Of the three survivors, one died at

Umtali and two were brought to Salisbury, where they contracted Coast Fever and died.

The symptoms and *post-mortem* appearances of Coast Fever and Redwater are very similar, and it was not until the beginning of 1903 that the two infections were differentiated by Dr. Koch. It should be noted that when a beast immune to Redwater contracts Coast Fever, the Redwater immunity breaks down, and the animal suffers from the double infection. A similar condition is observed when Redwater-immune cattle are attacked by Rinderpest.

I have enlarged somewhat on this subject, because in two recent publications, "Southern Rhodesia," by Hone, and an article by Mr. Robertson in the "State," an entirely inaccurate history of Coast Fever is given. These may in the future be accepted as correct, and I shall be glad if the Committee can see its way to embody in its report the correct history of the disease, which I may say is now accepted by Dr. Theiler.

In April, 1902, the disease was confined to stock which had grazed on the infected ground at or in the vicinity of Umtali and, Salisbury; but before the end of the year it had extended over most of the main transport roads in Rhodesia, and also to many farms adjacent to such roads. The history of the actual progress of the disease between its first appearance and the year 1905 is not accurately recorded, but at the latter date the following lists will shew roughly the extent of infection then existent.

(1) *Umtali and Melsetter*.—The main road from South Melsetter to Umtali and thence to Penhalonga and some distance farther north, also confluent roads, and most of the farms in both districts.

(2) *Umtali to Salisbury*.—Practically the whole of this road with large centres at Rusape, Headlands, Macheke and Marandellas. The road from Rusape to Inyanga, on which most of the farms were infected.

(3) *Salisbury district*.—Most of the cattle in the district succumbed. Practically the whole district was infected, and the roads to

(4) *Lomagundi and Mazoe*.—In these districts many farms were infected.

(5) *Hartley*.—The road from Salisbury to Hartley was infected, and many of the transport roads in this district.

(6) *Charter*.—The road from Salisbury to Charter and Enkeldoorn, and most of the farms in the Charter district.

(7) *Victoria*.—The road from Charter to Victoria and a large area around Victoria.

(8) The roads from Enkeldoorn to Gwelo and from Victoria to Selukwe.

(9) *Gwelo*.—The disease was carried from Salisbury to Gwelo *via* Charter - Enkeldoorn. It extended from Gwelo to—

(10) *Selukwe*,

(11) *Que Que*,

(12) *Insiza district*,

(13) *Bulawayo*, which includes part of the native districts of Umzingwani, Bubi and Matobo. From Bulawayo it extended to—

(14) *Belingwe*,

(15) *Gwanda*.

It may be remarked that the number of outbreaks in purely native districts was comparatively small compared with that of European stock.

During the years 1904 and 1905, the disease apparently abated somewhat; really, this was due to most of the cattle on the infected roads and farms having succumbed; but the disease was still active through calves born from "salted" cows or raw stock introduced for transport and other purposes.

In the infected districts most of the farmers had lost their cattle. The following estimate of the earlier mortality is taken from the report of the Rhodesia Farmers and Land-owners' Association for the year 1902:—

Bulawayo	...	...	...	3,621
Gwelo	...	...	...	1,000
Salisbury	...	...	...	4,740
Umtali	...	...	...	1,550
Enkeldoorn	...	...	...	761
Melsetter	...	...	...	1,860

Total ... 13,532

During the progress of the disease, no general systematic method of controlling it was adopted. In the latter part of 1904, general regulations governing the movement of cattle were promulgated for Matabeleland, followed early in 1905 by similar regulations for Mashonaland, and all infected areas were isolated. These were not officially quarantined, but no movement was permitted on or near them except for slaughter purposes.

The following schedule shews the number of infected centres in the various districts, and the mortality since the adoption of the general regulations:—

District.	No. of Infected Centres.	Mortality.
<i>Year ending 31st March, 1906.</i>		
Salisbury	...	24
Umtali	...	23
Melsetter	...	27
Inyanga	...	2
Gutu-Chilimanzi	...	1
Victoria	...	505
Marandellas	...	3
Mazoe	...	3
Bulawayo and Umzingwani	...	108
Bubi	...	—
Gwanda	...	1
Selukwe	...	33
		<hr/> 730
<i>Year ending 31st March, 1907.</i>		
Salisbury	...	1
Umtali	...	1
Melsetter	...	41
Victoria	...	271
Selukwe	...	30
Umzingwani	...	1
		<hr/> 345
<i>Year ending 31st December, 1907. (This includes three months of above.)</i>		
Umzingwani	...	143
Selukwe	...	7
Victoria	...	122
Melsetter	...	2
		<hr/> 274

Year ending 31st December, 1908.

Umzingwani	...	...	1	...	2
Umtali	...	...	3	...	154

156

Year ending 31st December, 1909.

Umtali	...	...	4	...	2
Marandellas	...	...	4	*	184

186

* This includes deaths from all causes.

During the current year, fresh outbreaks have occurred in Salisbury and Bulawayo districts.

At present the position of Coast Fever in Rhodesia is as follows:—

(1) *Umtali district*.—One infected area on which there are no cattle. This area is now being fenced.

(2) *Marandellas district*.—The infected veld is entirely fenced, and there are no cattle within this fence.

(3) *Salisbury district*.—(a) Gletwyn centre fenced and all cattle removed to clean veld; (b) Commonage centre fenced and all cattle slaughtered or removed to clean veld; (c) Stamford centre: Farm fenced; all cattle on it will be disposed of within a month.

(4) *Bulawayo district*.—The infected farm Crocodile Valley is being fenced, and all cattle on it will be disposed of within a month.

J. M. SINCLAIR
Chief Veterinary Surgeon.

Salisbury,
22nd August, 1910.



Animal dead, showing froth from nostrils.

The post mortem showed extensive lung lesions.

African Coast Fever.

By LL. E. W. BEVAN, M.R.C.V.S.
Government Veterinary Bacteriologist.

[REVISED].

The following brief summary of the characteristics of the disease known as "African Coast Fever" was drawn up for the benefit of stockowners some two years ago, but has now been brought up to date and is re-issued, as there still remains considerable uncertainty in many minds on the subject.

I.—HOW TO DETECT THE DISEASE.

(a) *By Symptoms during Life.*—These are not very distinctive, but the sick animal may evince one or more of the following symptoms: Dullness; loss of condition; running from nose, eyes and mouth; a husky cough; swelling of the glands of the neck and throat and flanks; weakness of the loins, and staggering gait; tendency to charge; constipation followed by diarrhœa; and there may be blood in the fæces. The tissues around the eyes may be swollen, and the eyes appear sunken. Often the sick animal will feed and chew its cud. Where the lungs are involved there may be distress in breathing.

The first indication is a sudden rise in temperature, which may reach 107° F., but notwithstanding the fever, outward symptoms are rarely met with before the last few days preceding death.

The disease is due to a parasite present in the red cells of the blood during the fever, and diagnosis of the disease can be made from the appearance of the blood and spleen pulp when examined under the microscope. (See paragraph 5.) The history of the case is important in helping to arrive at a correct diagnosis, and in preventing the further spread of the disease.

(b) *By Appearances after Death.*—The most important lesions are: Congestion of the glands of the throat and

neck; inflammation of the lining of the fourth stomach; infarcts of the kidneys (small yellow or purple spots about the size of a split pea or less, seen after removing the capsule or membrane covering the kidney).

Where the lungs are involved they may be distended with a straw-coloured fluid.

A microscopic parasite is present in the blood and bodies known as Koch's granules may be found in the glands and spleen.

2.—THE CAUSE OF THE DISEASE.

The disease is caused by a special blood parasite. (See photograph.)

3.—THE SPREAD OF THE DISEASE.

(a) The disease is only indirectly contagious; a sick animal will not infect another susceptible animal by contact or by any of the excretions or fluids of its body.

(b) The indirect agents of the infection are the nymphal and the adult stages of various ticks (chiefly the so-called "Brown tick").

(c) Only those ticks which in one of their intermediary stages have sucked an infected animal, are capable of transmitting the disease to other oxen.

(d) The infecting agent does not pass through the egg of the tick to the second generation.

(e) The infection on a pasture persists in the ticks which have dropped from sick animals.

(f) It is the tick which engorges on an animal during the time when the parasite is in the blood of the sick animal which carries the disease. (See paragraph 4 (d).)

(g) Two infected ticks are quite sufficient to cause the malady in a susceptible animal. Probably one tick would be sufficient.

(h) Immune cattle cannot infect ticks with African Coast Fever.

(i) The disease is peculiar to bovine animals; animals other than bovine could only carry infection by the merest chance.

(j) Once an infected tick has bitten on an animal, it apparently discharges its poison, since it afterwards fails to infect others.

4.—INCUBATION AND COURSE OF THE DISEASE.

(a) About twelve days elapse between the time when the animal became infected and the first manifestation of the disease, namely, a rise in temperature. With the rise of temperature, or shortly after, the so-called Koch's granules are to be met with in the glands and spleen.

(d) The typical causal parasites are present in the blood of the sick animal about three days after the onset of the fever.

(e) It is the tick which engorges on an animal at the time when the parasite is present in the blood, which carries the disease.

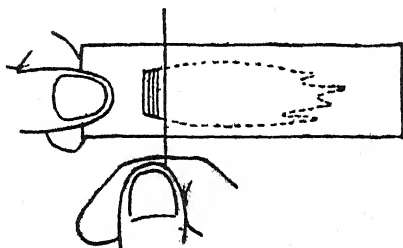
(f) It is necessary for infected ticks to go through a moulting stage before they are again ready to attack a beast; this moulting may take as long as six weeks or two months, varying with climatic conditions.

5.—HOW TO SEND BLOOD AND SPLEEN FOR DIAGNOSIS.

When a beast is suspected to be suffering from African Coast Fever, blood should be taken in the following manner, and sent with the greatest despatch to the office of the Government Veterinary Surgeon of the district, together with particulars as suggested in paragraph 9.



Drop of blood on glass.



The same spread out into a thin film.

(a) *From a Dead Animal.*—The whole of the ear of the animal may be cut off and wrapped in an antiseptic cloth and sent for examination.

If the time before the specimen can reach the Veterinary Surgeon's office is likely to be long, it is better to collect a small drop of blood from the cut ear, spleen or kidney, on a piece of flat clean glass, in the manner shown in the drawing, so that a thin film is formed. The film should be so thin that it will rapidly dry in the sun. Having wrapped the glass in soft material it is ready for despatch.

In all cases a little of the spleen pulp should be spread thinly on a glass, and a small portion of the spleen should be sent in a mixture of alcohol 1 part, water 2 parts, in a bottle with a closely fitting cork, carefully packed to escape damage in the post.

(b) *From the Living Animal.*—The hair from the edge of the ear should be clipped off and the ear washed and dried. The edge of the ear should be cut with a clean pair of scissors or knife. After a little blood has escaped a drop should be collected on the glass and treated as in the foregoing paragraph. Several labelled preparations should be sent from each case. The thinner the film the better for examination.

(c) Slides should be taken and sent every few days.

6.—HOW TO DETERMINE THE SOURCE OF AN OUTBREAK.

The following points should be borne in mind:—

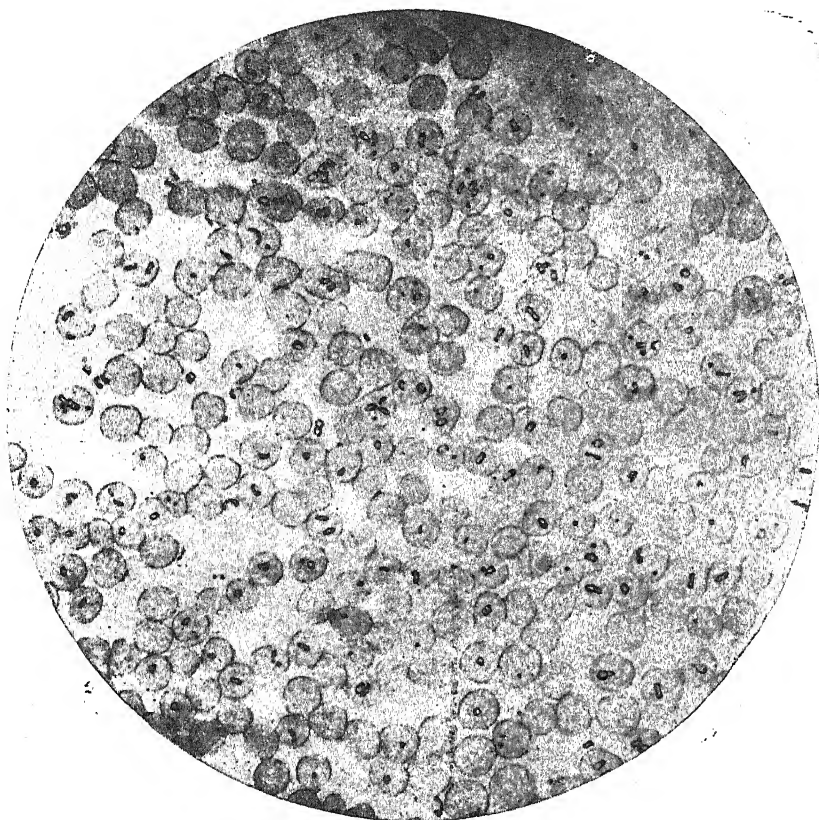
(a) If the sick animals have been on the farm for about 12 days before shewing a rise in temperature, it is practically certain that they picked up the disease on the spot.

(b) In the case of animals which have become affected whilst travelling, knowing that the disease may be in the system for about three weeks before visible symptoms are manifest, the probable region in which the infection was picked up may be estimated.

(c) A second crop of cases may not occur until six weeks or two months after the first case on account of the period occupied by the infected tick in the process of moulting. (See paragraph 4 (f).)

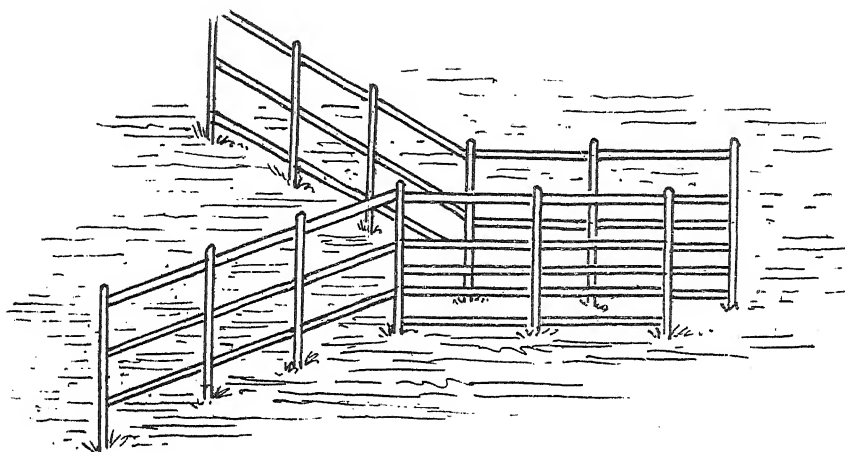
7.—PRECAUTIONARY MEASURES.

It should be remembered that fully 95 per cent. of animals affected with East Coast Fever die, and that, up to the

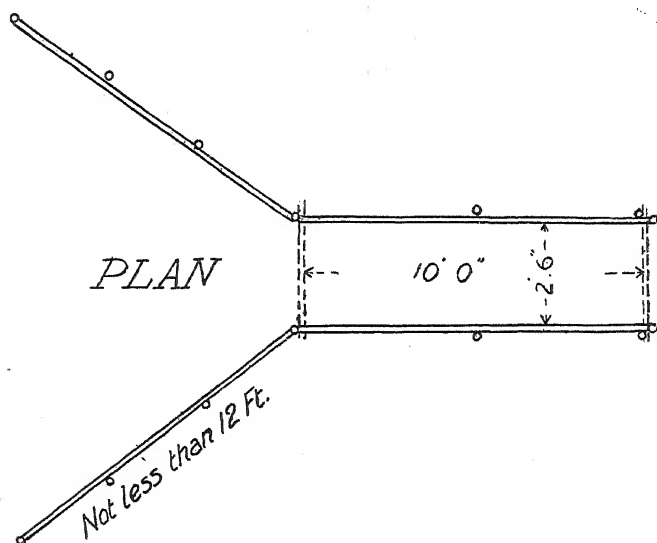


Micro-photograph of typical blood smear of African Coast Fever.

[From Journal of Comparative Pathology and Therapeutics.]



Cattle Crush and Pen for taking temperatures.



present, no successful method of treatment or preventive inoculation has been discovered.

The necessity for the most rigid precautionary measures is therefore evident.

Even in districts thought to be free from the disease, the cattle owner should be on his guard, and should observe the following precautions :—

(a) Careful observation of every sick animal, and notification to the Veterinary Department of any case of an unusual character coming to his knowledge. (See paragraph 9.)

(b) Isolation of all sick and stray animals arriving on the farm.

(c) Erection of a crush and pen for temperature taking and spraying.

(d) Eradication of ticks by systematic dipping or spraying.

Special Precautions should be taken in those districts where the disease is known to exist.

(a) Stray cattle, travelling oxen and all cattle newly arrived on the farm are the principal sources of danger, and should not be allowed to mix with other cattle on the farm until 21 days after arrival. They should be dipped and sprayed on arrival, and again before being allowed to mix with the herd.

(b) For reasons explained in paragraph 8, cattle should not be allowed to graze over the whole farm, but certain areas should be kept free from cattle, one portion being large enough to carry the whole herd indefinitely should necessity arise. In order that this reserved area be not too great a handicap on the grazing capacity of the farm, it should be supplemented by a haystack.

(c) To carry out the scheme defined in paragraph 8 it is advisable to erect a crush and pen to facilitate the taking of temperatures and spraying.

Stock owners should provide themselves with clinical thermometers, glasses for preparation of blood smears, bottles for the forwarding of spleen, spray pumps, and a quantity of dipping material.

8.—“TEMPERATURE CAMP” SYSTEM OF ERADICATION.

(a) Early-morning temperatures should be taken daily of sick and all in-contact animals (an easy matter if a crush and pen is available).

The normal early-morning temperature of an ox ranges from 101° F. to 102° F.; the temperature of young animals is a little higher. All animals with temperatures above 103° F. should be strictly isolated in a stable or hospital camp.

(b) Where there is little or no doubt that the animal is suffering from African Coast Fever, it is more profitable to destroy it at once. This will limit the number of ticks likely to spread the infection later on. (See paragraphs 3 (f) and 4 (d) (c).)

(c) All in-contact cattle whose temperatures are above suspicion should be sprayed and removed to a small, clean area on the farm (Camp No. 1), reserving a further portion of the clean area for the final distribution of the cattle if further cases occur (Camp No. 2). Whilst on the first clean area temperatures should be taken daily for at least three weeks, allowing for the period of incubation. (Paragraph 4.)

Animals registering 103° F. in the early morning should be destroyed or sent back to the isolation camp or infected veld.

(d) Those animals which have registered a normal early-morning temperature throughout the fortnight should be thoroughly sprayed and passed on to the larger clean area. (Camp No. 2). When spraying, special attention should be paid to the inside of the ears, and to the parts between the legs and under the tail.

(e) Animals may show a temporary rise of temperature due to causes other than Coast Fever. These, having been isolated, should not return to the other cattle until a normal temperature has been registered for a week, and then should be sprayed before departure from the isolation camp.

LAWS RELATING TO AFRICAN COAST FEVER.

African Coast Fever is a scheduled disease under the Animals Diseases Consolidation Ordinance of 1904. Special attention is drawn to the following sections:—

12. (1) Every person who shall have in his possession, or under his charge, or shall knowingly have on any land of which he is the proprietor, any animal infected with any destructive disease, shall

keep such animal separate from all animals not so infected, and shall immediately give notice to the occupier of all contiguous lands (not being lands situate within the limits of any town or village) and as soon as possible thereafter shall also give notice to the Magistrate, or any Inspector or Sub-Inspector of Stock, or person specially authorised by the Administrator to carry out the provisions of this Ordinance within the district in which such animal is, or to the nearest Justice of the Peace, or Native Commissioner, that such animal is so infected, and, on failing to act in the manner directed, shall be liable to a penalty of Twenty Pounds, or to imprisonment with or without hard labour for any period not exceeding three months, in default of payment.

17. In no case shall any animal, infected, or suspected of being infected with any destructive disease, except scab, be sent to any public pound; but if any such animal be found trespassing, it may be secured and isolated by the proprietor at some spot as near as possible to the place where found, or dealt with as prescribed by Sections 25 and 36 hereof, and the proprietor shall be entitled

from the owner to all reasonable and necessary expenses which may be incurred for feeding, securing, treating and taking care of or otherwise disposing of the said animal.

21. Any person who shall wilfully spread any destructive disease, or shall wilfully infect with any such disease any animal belonging to any other person, or shall be found in possession of any hide, skin, or portion of the carcase of any such animal which has died from any such disease as aforesaid, for the purpose of infecting with any such disease the animals belonging to other persons, shall be liable to imprisonment with or without hard labour for a period not exceeding two years.

25. Notwithstanding anything to the contrary contained in any Ordinance for the time being in force relating to Pounds and Trespass any animal found trespassing, during the subsistence of any notice issued in pursuance of Section 22 hereof, upon the property of any landowner or occupier of land, may be destroyed by the owner or occupier of the land so trespassed upon, and no compensation or damages shall be claimable for such destruction if:—

- (1) either any animal which shall be destroyed shall be opened in the presence of two independent witnesses, who decide that such animal was infected with a disease to which the provisions of this Ordinance apply, or,
- (2) such destruction be authorised by an officer duly appointed to carry out the provisions of this Ordinance.

(The above Section applies to Rinderpest and African Coast Fever only.)

The movement of all cattle within the provinces of Mashonaland and Matabeleland is strictly prohibited except under certain conditions enumerated under Government

Notices 268 of 1907; 151 and 356 of 1908; 39 and 216 of 1909; 168 of 1910.

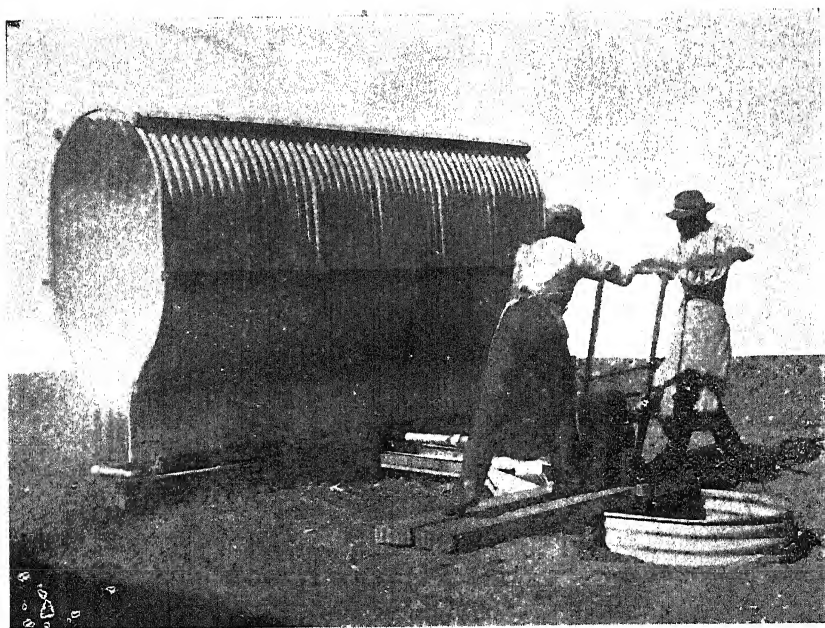
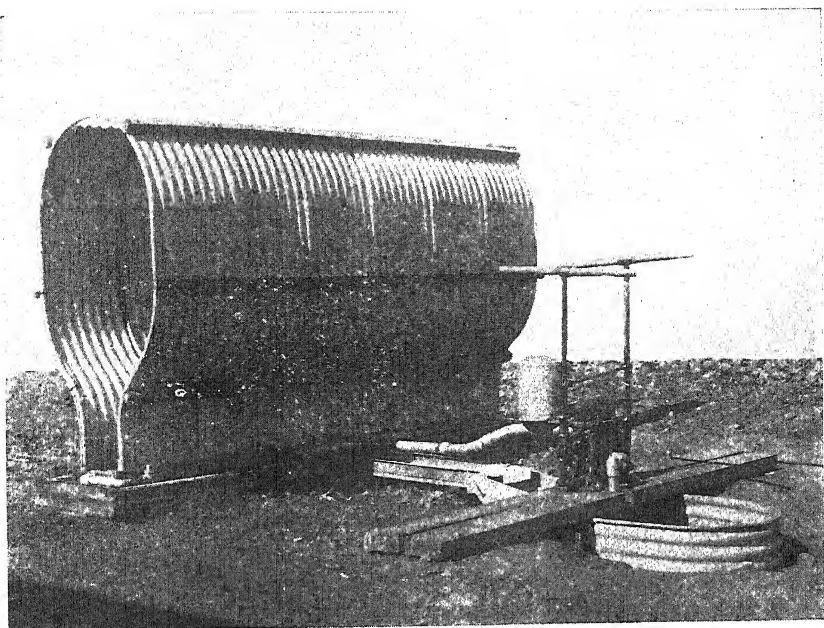
These Notices are fully reproduced in the *Rhodesia Agricultural Journal*, and may be seen at the local offices of all officials of the Veterinary Department.

9.—PARTICULARS WHICH SHOULD BE GIVEN IN
REPORTING CASES OF SICKNESS.

1. Age, sex, colour, and breed of animal.
2. Where sick. How long in present locality. Place from whence animal came.
3. How long sick, and when death occurred.
4. Symptoms: Temperature; breathing; state of coat; appetite; urine and fæces; any unusual conditions.
5. Post-mortem condition of blood; glands of throat; wind-pipe; lungs; heart; liver; stomach; kidneys; bladder; any unusual condition.

In describing size and colour, compare with some well-known object.

6. Temperature of animal at time when smears were taken, and part of dead animal from which smears were taken.
 7. Number of animals on the farm. How many sick or dead to date.
 8. Treatment and preventive measures adopted.
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Cooper's Patent Spraying Tank.



Farms and Farming in Rhodesia.

THE MAZOE DISTRICT.

By ERIC A. NOBBS, Ph.D., B.Sc.

The Mazoe District comprises the entire basins, from their source, of a series of more or less parallel rivers flowing in a north-easterly direction, and ultimately joining together in the Mazoe, which passes out of Rhodesia near the north eastern confines of the territory into Portuguese East Africa, where it finally joins the Zambesi. An irregularly shaped area of roughly 3,000 square miles in extent, it is bordered on the west by the Umvukwe Hills and Lomagundi, on the north by the Darwin District, and on the south and east by the river boundaries between it and Goromonzi district. On the south it shares with the latter district the possession of that fertile tract of level plateau—the Gwibi Flats; mealie land *par excellence*, from which arise within a few miles of each other, rivers flowing in very different directions and through very varied country—the Mazoe and its tributaries, such as the Tatagura, Umrodzi, Poorti and Umwidsi; the Gwibi flowing westwards; and on the south the Makabusi and other feeders of the Hunyani River.

From this central tableland numerous valleys wind between steep rugged and wooded hills, gradually widening and joining together, forming small plains or basins. These valleys very clearly cut the district up into distinct areas, and vary very materially in fertility, some, such as the Tatagura, Mazoe proper, and Moore's Concessions, have been in occupation for several years and comprise some of the most advanced and settled portions of Rhodesia, ranking in this respect along with the neighbourhood of Salisbury and other large centres. To the east side and the north the country is agriculturally poorer, but being well watered and favourably situated, it is being rapidly taken up for pastoral purposes. As the general level of the country sinks towards the north, so the height of the hills from their bases rises, and Mazoe possesses in the Umvukwe, N'deri, Shashi, and the Iron

Mask, a heritage of mountainous scenery which adds much to its attractiveness and to the pleasure of residents and visitors.

The soils are derived from dolerite, schists and granite, and are fertile in descending order accordingly :—

Great differences are found in the character of the soil and in consequence Mazoe offers a wide field for investigation, and requires much study before the most can be made of the varied possibilities of the district. Much attention has been and still is devoted to mining development, but this is beyond the scope of this article save in so far as it affects the farming conditions. Suffice it to say that while the prospector and pegger of speculative claims, makes his presence felt in a manner not favourable to the farmer, he is regarded as a necessary forerunner of genuine mining enterprise, which will in time give a reliable and permanent local market. That the established mines have not always yielded the market anticipated is perhaps regrettable, but nevertheless, mines mean mouths to be fed, both European and Native, and someone must provide the food and someone else must pay for it.

Lime occurs in deposits at many different places in the district, occasionally as compact but not very hard rock, as, for instance, on the famous Insigesi and Pimento Park, where it is very rich in remarkably beautiful fossil remains; but more often it is found a few feet below the surface in vleis, or as an outcrop around a spring, and here it is usually of a spongy texture, light and loose, and often somewhat resembling pumice stone. A number of samples have been submitted for chemical analysis, and it is hoped that the results of this examination may soon be made known, and throw some light on the value of these beds for manurial purposes as well perhaps as for the cyanide process on the mines, for which they are already to some extent employed,

The veld of Mazoe is as varied as its soils. Grass is everywhere abundant, varying in character; on the Gwibi Flats, on the hills, and becoming more and more rank as one goes into the valleys. In some of these vleis reed swamps occur, which when drained and cleared furnish some of the richest of soil. Mr. Backhouse and Mr. Scott on such soil

have reaped crops of 28 and 30 bags of maize per acre and this seems the crop best suited to tame such land in which for years the reeds continue to appear and grow amongst the maize, which itself is quite abnormally tall and coarse.

The granite veld presents no peculiarities different from the same class of soil elsewhere, there is abundance of moisture, and its chief value lies in the early grazing it provides.

On the red soil the veld is rich, and in the present incompletely stocked state of the country, much more than ample during the growing season for current requirements; but from August until the rains come there is apt to be shortage of food supply and, although the extensive mealie lands at present meet this need in a great measure, the fact remains that the time is not far off when farmers must grow crops for their stock and not as now for immediate sale only; especially is this necessary where the cows are milked, or the cattle are improved above the level of the native. The drawback of the red soil is no doubt the fact that the veld does not sprout early upon it as on the granite, but in Mazoe where possibilities for irrigation on at least a small scale, and often on a comparatively large one are so numerous, there should be no difficulty in having at least some succulent food during the dry time of the year, and no excuse exists for not having abundant stores of hay in such a wonderful grass country.

Few districts are so favoured with numerous small perennial streams as is Mazoe. Less abundant perhaps than in Melsetter and Inyanga, there is yet more land on to which the water can be brought with ease, and which possesses sufficient depth and favourable inclination for irrigation. As yet but little has been done however. A scheme planned and partly exploited on the Umrodzi and Garamapudzi rivers has not yet been carried to a successful issue, and along the lower parts of the Mazoe River nothing has yet been done to raise the river out of the somewhat deep channel in which it flows. So far indeed, what irrigation has been attempted, and the whole amounts only to perhaps one hundred acres, has been done at the head waters of the rivers.

Thus Mr. Clayton on his farm Hereford has utilised a vlei and drained from it water for some 30 acres of land, and is now about to increase this area to 70 acres, on which he can grow an abundance of winter forage and probably lucerne. His neighbour, Mr. Mathews, of Welston, has made a dam further down in the same valley, which commands several acres and similarly, Mr. G. Lamb, on Eastbank, has used the springs in his kloofs to irrigate a few acres of land valuable for market garden crops and fruit trees, which he is growing most successfully. In the same vicinity Mr. Backhouse has to turn his energies to the problem of draining water from what was originally a swamp, and has now one of the most productive farms in Rhodesia. A little further down the Mazoe River, we find the first weir and furrow, constructed a number of years ago by Dr. Sketchley on the farm Lowdale, and commanding a good acreage of fertile ground. The three acres of irrigated onion beds on the adjoining farm Ingleborough have acquired a local fame from the profits derived from them by Messrs. Reed and Tait. These pioneer efforts, creditable as they are, form, however, but a foretaste of what may be done. At the present time Mr. Watt, the Irrigation Engineer attached to the Department of Agriculture is engaged in a reconnaissance of the Mazoe and its tributaries, with a view to ascertaining the most feasible projects. A preliminary examination gave sufficient justification for the opinion that it would be possible at reasonable cost in several places to construct irrigation works, which would bring considerable areas under the furrow and would permit of the cultivation to advantage of such crops as wheat, barley, and oats in the winter, and materially facilitate the growth of citrus fruits. By enabling the early planting of tobacco, and by minimising the amount of replanting necessary, the acreage under that crop may be very much increased at the cost of a minimum of water. Indeed, a few acres even, of irrigable land to a farmer who is to-day restricted to summer crops, would be of enormous advantage, enabling him profitably to employ his labour throughout the season, turn over his capital more rapidly, and entirely alter his methods so as to produce more and spread his capital and labour over a more varied field, thereby reducing his risks and increasing his sources of profit. For such purposes the streams of the Mazoe district hold out good promise.

Mazoe district has played its part in the history of Rhodesia. Moore's Concession was virtually *imperium in imperio* at one time, and the farmers now occupying it claim the freest and best title of any of the numerous forms of land tenure extant. During the Rebellion much fighting occurred within its borders, while the heroic episode of the Mazoe Patrol is one which generations to come will remember with pride. Although parts were early occupied, it is only of late that many of the farms in the outer portions of the district have been taken up, and though now occupied, allowance must be made for the very young state of many of the holdings. The next few years will therefore show great changes, and very considerable development is assured beyond what the present statistics indicate. A factor in the general wellbeing is the active existence of two Farmers' Associations, the one meeting at Mazoe and the other at Kimberley Reefs, while several farmers on the south side belong to the Salisbury body.

The Co-operative movement was early taken up by the Mazoe farmers and has made great headway, comparatively few crops of maize not having been placed in the hands of the Society. The mines right out to Mt. Darwin are being supplied, and everything done to economise haulage. Had every farmer been seeking his own market, no doubt there would have been much unnecessary riding of mealies to and fro, which is obviated where the stocks are pooled. The crop being a heavy one, there is unavoidable difficulty in handling it, especially as farmers are anxious not to ride transport but to use their cattle in ploughing up more land, all in hope that by next harvest they may be able to send the crop away by rail. Co-operation has undoubtedly proved a boon to many, and its extension to other staple crops is to be expected as these become of sufficient importance to justify this method of disposal.

In a district where relatively so much attention is paid to arable farming and crops requiring thorough cultivation, such as tobacco, onions, potatoes and maize, more labour is required on each farm than in other less intensely farmed parts, or where stock-raising is the main industry. The outlook in this respect is causing grave anxiety, especially amongst the newer settlers, of whom again there is such a

large proportion in this district. Old hands as a rule get local labour, such as it is, for the boys know them and come long distances to work for them; but the newcomers are dependent on bureau boys or alien "volunteers," and these are scarce. The matter is one requiring earnest and immediate consideration, for so much of the pioneer work of the first few years on a farm is necessarily hand and unskilled labour which no machinery or white labour can replace, and which is necessary in order to prepare the way for the up-to-date and mechanical processes of high farming.

Transport is an important factor in the district. Traffic between the railway, Salisbury and the large mining centres at the Jumbo, Kimberley Reefs, Shamva and Mount Darwin, employs an enormous number of mules and donkeys and, within prescribed limits, of oxen. Trains of wagons are constantly to be met with on the through roads, while wood riding and the conveyance of grain from the farms towards centres of consumption gives even bye roads a busy air. A railway would release a great deal of ox power for farm work, while the increased activity which follows in its train, would probably give ample occupation to the equine hauling power now doing work more fitted to a locomotive. And as with farming and mining operations so with the use of the roads there seems to be a rapid increase and constant progress. The motor car has long since established itself for fast work, and Mr. Garvin keeps one on his farm for his personal use.

Malaria has undoubtedly been prevalent, and is to be regarded as endemic. This implies that it is a prime essential that the simple recognised precautions should be rigorously followed, and if this had been the case heretofore, there is little doubt that less sickness and fewer deaths from Black-water would have been recorded against the district. Mazoe hardly compares well with certain other districts as regards the character of the dwellings erected, on the Concession side at least. This is largely a matter of imitation or fashion, and now an awakening is manifest, and brickfields and kilns are the order of the day, while scattered about there are already excellent dwelling houses, such as those of Mr. S. Biggs, Bellevue; Mr. Marriott (in course of construction); Mr. E. Scott, Wormwood; Mr. Newitt, Avonduur; Mr. Garvin,

Sleamish; Mr. Crofton Townsend, Lowdale; Mr. Backhouse, Calgary; Mr. Gibson, Weltevrieden; Mr. Black, Selby, and others. But huts and ramshackle makeshifts are too prevalent, and the mosquito is often given free play. Breaking up of new land seems to favour the trouble, and as most new settlers live somewhat spartanly, it is hardly to be wondered at that bad cases of fever do occur. These difficulties are as a rule realised, and it is likely that less and less will be heard of the malady, as is the case elsewhere, when the country takes on a more settled and established form and when people are able to take greater care of themselves.

As regards diseases of stock, the district has a fairly good record, and cattle particularly are thriving very well indeed. Horse sickness is as prevalent as elsewhere, and in the lower parts may occur all the year round. Strangles has of late been common owing probably to the considerable importation of donkeys for transport purposes, but on the whole the reputation of the district as a healthy one for stock is of the best.

Considering the large number of farmers in the district the total number of cattle (approximately 6,600 head) is somewhat disappointing, though for this there are several good reasons. About 2,900 draught oxen are in the hands of the farmers, but a great deal of transport is done by professional transport riders, who also use mules and donkeys. These are not counted in this enumeration, unless also used for farm work. Many of the newly settled farmers were about to procure stock when prohibition of movement had to be put in force in the Salisbury district, and they were cut off from their sources of supply. This also probably accounts for the paucity of breeding cattle. Many farmers have from 20 to 60 head, while a very few are devoid of any, and rely on goats or the "condensed tin" for their milk supply. This state of affairs is the more regrettable, for the owner of a few head cannot afford to keep an expensive bull, and has usually to be satisfied with something more or less mongrel, and hence, however much bigger than the native cow, yet often unreliable and faulty. Increase is rapid and no doubt a few years will see a great improvement in this respect, but meantime the position is not satisfactory. Health and condition and rate of increase are good, but such yield should

carry more stock, and with so much cultivated land artificial food should be abundant even where early veld is scarce. No doubt the deficiency is but transient and is realised by those most concerned, for cattle are readily bought up when opportunity offers and bulls with some superiority about them are sought after. Should dairying progress as seems not unlikely where the farms are of limited extent, there will no doubt be a demand for milking strains, while the newer settlers in the north and north-east of the district are likely to seek beef and a ranching type of beast.

An earnest effort to breed good stock and one promising well of itself and for the country is to be found on Mr. Clayton's farm, Hereford, where two small herds are kept, one of Afrikander Shorthorns, and the other of graded Frieslands. The young stock were imported from Cape Colony as two-tooth heifers and have now for the most part grown into large roomy animals. About a year ago Mr. Clayton purchased one of the young Sussex bulls—Ethelbert Sampson—imported by Mr. L. E. W. Bevan, and the Short-horn Afrikander heifers are now calving down to this bull. The calves, though still young, are exceptionally fine specimens, growthy, well ribbed up, and possessing plenty of bone. In order to still improve the standard Mr. Clayton, who has recently left on a visit to the Old Country, intends to bring with him on his return several pure bred Sussex heifers and probably one or two young Lincoln Red bulls.

Dairying is not extensively practised in the district as yet, though on the farms Summerdale, Somerly, Rockwood and M'sasa, and on the Great B, it forms a regular part of the routine both as a fresh milk and a butter trade. With such ample opportunity for growing succulent crops in winter and such excellent summer pasturage the outlook would be bright but for the present difficulty of obtaining reliable milkers.

In a district where horse sickness is so prevalent equines are necessarily scarce, and in the hands of farmers there are only about 30 horses all told, three times as many mules, and upwards of 200 donkeys; the latter kept in some measure for breeding as well as work. Flocks of small stock of one or two hundred do well, though large numbers scarcely find adequate pasturage if kept in one flock. There may be about

2,000 sheep in the district and 550 goats, the latter in some cases being kept for their milk. Superior goats give up to four bottles a day, and are therefore a valuable asset for domestic purposes where other milk is often scarce.

Not a few men go in for pigs, which are found to do very well and are valuable gleaners after the maize crop is harvested. There must be close on 1,000 pigs kept in Mazoe, but this is a figure which naturally is constantly and rapidly changing. Messrs. Jarvis and Short, at Summerdale, make a practice of curing bacon, killing as many as ten pigs at a time, and turning out a very creditable and sound article. Mr. S. Biggs, Bellevue, and Mr. Appleby at Rockwood, have also made a feature of pig rearing, while Mr. Backhouse on Calgary, farms systematically with them, running a herd of from 150 to 200, feeding them off in batches and selling them at from 120 to 200 lbs. live weight while still quite young. He has lately imported from the south a pen of well bred Berkshires. Some excellent specimens of the breed will also be found on Mr. Clayton's farm. Properly cared for, kept clean and well looked after, there is money in pigs, especially where, as in Mazoe with so much natural food for them and so much mealie lands there is unavoidable loss of grain, which is best gleaned by the pigs. Some years ago a bacon factory was mooted, but the scheme fell through. It should not be difficult with pigs becoming so plentiful in the country to carry on an unpretentious business in the making of bacon, lard and sausages, and at the present relatively low price of maize and the high price of bacon the transformation of the one into the other has an attractive appearance.

It is not too much to say that the Mazoe district gives every indication of being, along with portions of the Goromonzi district adjacent to the Gwibi and around Salisbury, the granary of Rhodesia, the area, that is, in which the largest percentage of land will be, and even is already under the plough. This will of course be only a fraction of the total area, and stock will ever form a very important portion of the Mazoe farmers' wealth; but none the less the proportion of the land cultivated is, and will continue to be, high. No district offers as much scope for maize growing, while

numerous other crops are coming to the fore and bid fair to render feasible the idea of continuous working of the land without leaving it to "rest." This, together with the possibility of putting a considerable area under irrigation and the success which is attending the cultivation of citrus fruits, means that Mazoe must be regarded as a district in which the application of high farming methods are called for, where the arable farmer will predominate, and the price of grain be the prime interest of the community.

Maize grows to perfection and offers, if not the highest, certainly the quickest return on money invested in it. In many cases it is the only crop; in every case it is the principal crop. That it will always remain so is by no means sure, but it is likely long to continue the staple product of the district. It is the readiest crop to grow, it is the best understood, the safest, and at the moment the easiest to sell, although the price is not what it once was and leaves little enough over as a reward for the time spent on it and the capital invested. The crop of the district now reaped is calculated to be as near as may be 112,000 bags, equivalent to perhaps 11,200 tons of grain. Of this, one or two hundred bags suffice for the needs of each of the 130 occupied farms which may be taken as being concerned. The balance is finding its market on the mines round about and in Salisbury, and a great part of the crop is being handled by the Farmers' Co-operative Association. The yield per acre varies from two bags—which may be set down as a failure—to ten and even more, while nine bags is quite a common figure. The average for all is about 8.2 bags per acre, a very high average which speaks volumes for the general fertility of the district.

Salisbury White and Boone County, more or less pure, appear the favourite sorts, the former being in the greater favour, while 8-row Hickory King is preferred on the lighter cropping lands. Unfortunately the seed obtained last year was generally disappointing, else the figures for the total crop might have been markedly higher. There is a great need of attention to the kind and quality of the seed to be used, a fact fully realised by those concerned but unfortunately difficult to accomplish. For this reason the reputation of Mazoe maize must temporarily suffer until good seed can come into general use throughout the district.

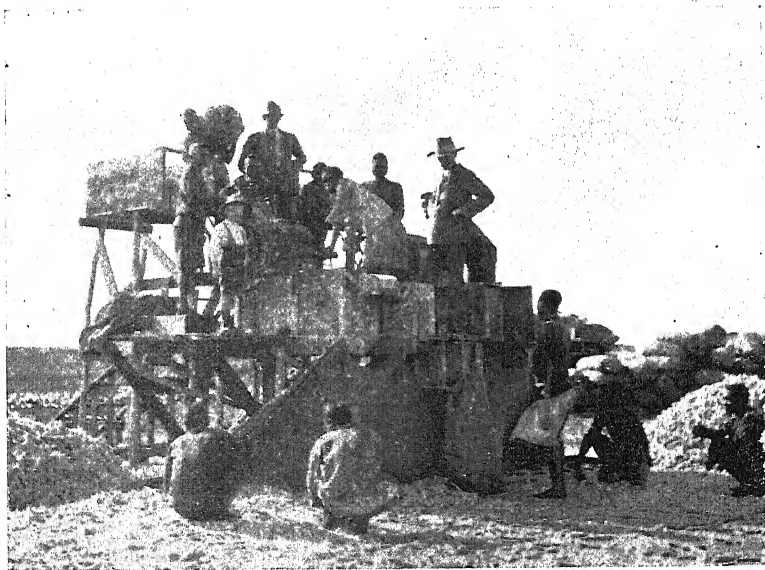
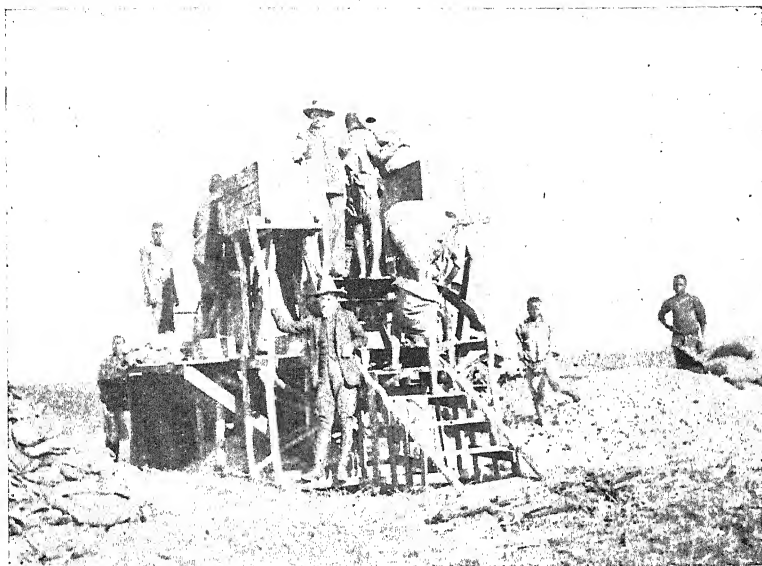
The broad acres of the Gwibi Flats probably offer the easiest and cheapest area for maize growing, and hence production per bag should work out favourably there. Yet the rich lands of Moore's Concession give heavier returns per acre, and both the heaviest average yields and biggest individual crop stand to the credit of Mr. Backhouse on Calgary, who can show many acres of land giving 20 to 30 bags per acre and whose crop this season amounts to the very satisfactory grand total of over 5,300 bags.

Mr. C. Southey, on the Concession, has grown Golden Eagle, a yellow mealie, undoubtedly a heavy cropper and producing a heavy grain, but on account of its colour alone, rather out of fashion and damaging to the crops round about, for a few yellow grains at once alter the grade as regards export, from "flat white f.a.q." to "mixed." Where white maize is so definitely in vogue and where our best class of whites is at a considerable premium for export it is a pity to introduce another type, even though in itself a good one. The drawback to maize production at present is the high cost and slowness of transport to market by road, and Mazoe farmers live and continue to extend their mealie lands in the sure hope that the railway is coming. The methods pursued are as a rule well up to date, and the three, four and even five disc plough is busily at work. The lands are as a rule clean and well planted, but some farms are notorious for their Black Jack crop, and certainly some soils seem to favour the growth of weeds more than others. Harvesting by hand and shelling by hand-power machines are the rule, and a tedious process it is, but crops are now grown on such a large scale that it cannot be long before more economical mechanical means are sought to do this work.

Power shellers are still few and far between in Rhodesia. Mr. Kirkman at Stamford, near Salisbury, has had one in use for some years, and Mr. Bland, of Insiza, has shelled his mealies with power, but the credit of introducing the first large portable maize husker and sheller into Mashonaland rests with Messrs. Pretorius and Short, who have imported and used on the farm M'gutu a machine by Messrs. Ransome, Sims & Jefferies, of Ipswich, England. This outfit has since its arrival given complete satisfaction, and proved in every way an economy of time, money and native labour: the last

the greatest consideration of any. It is of the size indicated as "42in. drum," and requires a four nominal horse power engine to drive it. The machine has a capacity of 60 to 80 bags of maize per hour. Instead of laboriously husking crops in the field, and losing a few grains from each cob, the complete ear in the husk is conveyed to a convenient centre and stacked pending the arrival of the machine. It is well to have the maize on a raised platform or to make some other arrangement for feeding rapidly, for it can take more than can be readily fed into the hopper from the ground or out of racks. The ears are conveyed mechanically to the top and are fed into a drum. There is a steady hum, and the husks are thrown out so little damaged as to convey the impression that the ear is within, but this is never so. The cobs shoot out elsewhere, and are readily collected. There is no need to hand-pick them as is so generally the case with manual machines, for there are no grains left to pick off. Chaff and dust are blown out and broken grain, which is generally mixed with the whole grain in the usual process, are all separated out at one side. Though the total of this is trifling it yet secures that the bulk sample is pure and clean. At the end opposite the feeder the kernels gush out into sacks ready for sewing up. At one side a more gentle stream of mealies of extra large size may be collected, the choicest of "choice white flat" grade. The owners are very well satisfied with the results secured. There is no injury and no waste. No grain is dropped in the field or mealie hock, one white man and ten boys can handle and serve the machine, including sacking, sewing up, and stacking the bags, and do many times as much as three times the number of boys could with the hand machine. The crop can be harvested more rapidly and with fewer boys, as no husking is needed in the field.

There are many similar machines on the market though not in Rhodesia, and in our advertisement pages an illustration will be found of one by Messrs. Marshall & Sons, of Gainsborough, procurable from Messrs. D. E. Hockley & Co., of East London, as well as one of the same make as that seen at M'gutu, and for which Messrs. Tarry & Co., Bulawayo, The Bechuanaland Trading Co., Salisbury, and Messrs. Meikle & Co., Salisbury and Gwelo, are agents.



Arrangement for Shelling Mealies by hand
As used by Mr. Newmarch, Thorn Park.

With many individual crops of 2,000 bags, and not a few of 3,000 and 4,000 bags in the country, we cannot afford to neglect such labour-saving conveniences, and not another season should be allowed to pass without several being put to work in our maize-growing districts. Such a machine can with ease travel from farm to farm and handle in three or four days a whole crop, on which by present methods the farmer may be spending many weeks of his own and his boys' time, better devoted to clearing land, making bricks, or the hundred and one things which want doing on every well-conducted farm.

In perhaps a less ambitious way than the big power sheller at work on M'gutu, but with the same end in view, Mr. Newmarch, on Thorn Park, has devised a labour-saving device whereby with but twelve boys he can do what normally requires thirty, a big economy. He has constructed out of packing cases and rough native poles securely bolted together a platform mounted on runners which can readily be yoked to a span and hauled about the lands, especially where these are level and smooth as on the Gwibi Flats. A short ladder or stair runs up to the platform between the runners from the front of the sledge. Up these the ears are carried in sacks as shown in the illustration kindly furnished by Mr. Newmarch, and thrown into two hoppers, right and left, these in turn command the feed boards respectively of two ordinary manual "Lightning" shellers worked by "mealie pap power," and the cobs fall down below the platform while the shelled grain passes into a box with two outlets similar to those on a power sheller whereby continuous filling of the sacks is possible. This plan is certainly ingenious, cheap and applicable with advantage on many farms where the visit of the power mealie sheller is not yet possible.

With a narrow margin of profit, and such large quantities to handle as many farmers now have, every economy however trifling helps, and every bag of marketable grain must be secured. Another means of augmenting our profits without labour and at comparatively little cost is by the use of good seed which on the same soil and with the same treatment will give several bags more per acre than inferior seed. This is generally realised in theory, but in practice the difficulty has been hitherto to get reliable and good seed

and it must be regretfully admitted that while we can, as the results of the Johannesburg Maize Show convincingly demonstrate, produce the best, yet many of our crops leave much room for improvement as regards quality. This is unpleasant to contemplate, but as the desire to improve in this respect is very general it cannot be long ere improvement is shown; indeed, everywhere farmers are making an effort to get really good seed.

As far as tobacco is concerned, Mazoe promises to take one of the foremost places. A few years back a number of farmers built flue curing barns, but several of these have fallen into disuse, although, in view of recent developments some of their owners rather wish they had persisted. At Sleamish, Mr. Garvin grows over 80 acres annually and has an imposing line of six barns, together with other necessary outbuildings for dealing with his crop. Failure of the transplants to establish themselves during the trying weather accompanying the beginning of the rains is one of the chief anxieties of the tobacco grower, and to obviate this and to avoid replanting, also to extend the period of the planting season and give more time for harvesting and curing the leaf, Mr. Garvin has quite recently erected a gas suction plant for the purpose of pumping water into a reservoir from which it can be led on to the tobacco lands. By this means he secures a month or more start and avoids any doubt of the transplants coming away strong and rapidly and without those checks which are so inimical to the quality of the leaf. Other growers on a considerable scale during the past season were Dr. Sketchley, Glendale; Mr. Newton, Thetford; Mr. Marriott, Poortlock; and Mr. S. Biggs on Bellevue; while, tempted by the brighter prospects, a number of men purpose going in for tobacco tentatively next year to gain some experience before embarking on it on a larger scale.

Last year in the district some 160 acres were devoted to tobacco, and this is a trifle to what might be grown. Knowledge of the crop and an adequate and reliable supply of labour are the two essentials still needed, the others: suitable soil and a remunerative market have been proved to exist, and the quality of some of the samples grown are all that could be desired.

After the major crops come a number of others which are as yet only grown on a small scale. Potatoes could with ease be produced in any quantity and supplied all the year round if an adequate price for this somewhat exacting and laborious crop could be depended upon, but farmers have been very much discouraged in this direction, which is the more to be regretted as potatoes are so strongly recommended by our medical authorities as an anti scorbutic to be supplied to boys in the mine compounds and as a form of vegetable food which keeps well. Only about 60 acres of potatoes will be found throughout the whole district during the course of the present year, whereas, with reasonable prices and a reliable market, many times that acreage¹ would be planted. Farms vary in respect of the season at which they can best furnish potatoes, but by suitable combination an all-the-year-round supply should not be impossible to secure—the benefits of which in arranging contracts is obvious.

Onions require peculiar conditions, but this most valuable crop has been grown very successfully in several instances and its cultivation is likely to extend considerably in the district, the chief limitation being the market and the difficulties which seem to confront sellers as soon as they have more than a few bags to dispose of.

Beans, on the other hand, are usually readily saleable in larger quantities than farmers are able to produce this somewhat erratic and risky crop.

Ground nuts are advancing in favour. About 200 acres were planted last year and much more is likely in the present season. On the heavier soils this crop is somewhat difficult to handle, it is essentially suited to loose and even sandy soil, and offers along with manna, beans, pumpkins, rape, kale and mangold a useful purpose as an occasional change to the soil from a too frequent cropping of maize. Ground nuts deserve more attention than they have so far received.

Another crop being more and more grown now that the earlier and quite unreasonable prejudices against it are being removed, is manna for hay. In one or two cases considerable fields of this excellent crop are sown, but as a rule only a few acres mainly for personal use are met with. The area

under manna and Californian millet last year was about 200 acres. This being a bulky crop awaits the advent of the railway before much can be produced for distant markets. The current price of manna hay in Salisbury it may be remarked is about 7s. per 100lbs.

Oats are grown to a very limited extent on moist ground or under irrigation for horse feed, and barley is similarly sown on but a small scale. Only six acres of wheat, and these mainly experimental, are to be met with, but should irrigation extend along the valleys there is no reason to doubt that this will become one of the major and most profitable crops grown.

Linseed is also coming into prominence and grows well. At present the price obtainable is about $3\frac{1}{2}$ d. to 6d. per lb.—according to the purpose for which sold, whether feed or seed. The crop is one which might occupy a few acres on every farm, since there will seldom be a time when some animal or other will not be the better for a handful of grain or a few feeds of linseed gruel.


The Mazoe lemon, identical with the Cape rough lemon, and occurring wild in many places in the district in spite of ruthless felling by natives for the sake of the fruit, has long pointed to the possibility of citrus fruits doing well under cultivation, and a number of farmers have planted orange trees, the oldest being those at Esperanza, now showing some splendid specimens bearing heavily. Mr. Garvin has over 1,200 trees doing well, while elsewhere groves of 50 or 100 are met with. Recently the Mazoe Citrus Syndicate has taken up the matter on the farms Smithfield and Laurencedale and have so far put in upwards of 1,000 trees as a beginning. But these figures, amounting to about 5,000 trees altogether, are but a trifle to what may be done, especially, as is hoped, Rhodesia may cater for the European market as well as for local consumption. At present there seems to be a feeling in favour of seedling trees in preference to grafted ones. This is perhaps more due to the success of the former than to the actual failure of the other, but the matter is one which deserves closer study. For export, uniformity of flavour, quality, size and keeping properties is of primary importance and this is next to impossible to obtain from seedling trees. Another point of interest is the need of water. It is desirable

to keep all citrus fruits as far as may be out of frosty hollows, yet there can be little doubt but that it is an advantage to place the grove under a furrow, so that occasionally, perhaps but once or twice in the year at critical times, a good soaking can be given to the ground; for, though it has been demonstrated that oranges can be grown without artificial water, yet a greater security of return and a better crop is to be anticipated where on occasion water can be supplied.

The choice of sites is much influenced by these two considerations and further by shelter from cold and stormy winds. Almost every farmer has his orchard of varying size where everything imaginable is being tried. In individual cases perhaps everything has succeeded, but on the principle that one swallow does not indicate summer, the general impression left after seeing a number of instances is that our Northern European fruits are not adapted to a climate where the resting period of vegetation is so very feebly indicated, and that stone fruits, except perhaps the very earliest ripening varieties, which may escape, are too liable to injury by the omnipresent fruit flies, leading to the presence of maggots in the ripening fruits. Wherever the "mohobohobo" appears in quantity, and that is often, it may be well to go in rather for appropriate sub-tropical and tropical fruits such as bananas, pineapple, guavas, paw-paw, grenadilla, tree tomato, oranges and naartjes and their allies, also perhaps quince, roselle and loquat. These apparently do well with but a minimum of attention, and provide the remote country household with most welcome and necessary diet, as well as offering opportunities for a side line in the earning capacity of the farm.

Figures given elsewhere of crops and acreages would be multiplied several fold in a very few years, and a large population brought on to the land, were there but reliable means for conveyance of produce and requirements. Agitation in this direction has of course been on foot for many years, but a better case can be made out to-day than in the past; the people have gone out ahead of the track, not following it as often happens with colonisation elsewhere, and have proved the country. It is not difficult to prognosticate that at no distant date the cultivated area of Mazoe will

be several times what it now is. There is hardly a farmer not extending his lands, and new settlers are tearing up the ground as fast as they can. There are signs of a tendency to sub-division of the land into comparatively small areas, several men having lately bought such small holdings as five and seven hundred acres on which to farm, and which, without irrigation, is certainly rather little for the conditions prevailing, while some of the large land-holding companies are selling farms of one thousand acres. The utilisation of the abundant streams of water for irrigation purposes will very materially advance the crop-growing possibilities, greatly improving the prospects of dairying and citrus growing, and making the cultivation of potatoes, onions and vegetables all the year round so easily possible that farmers can meet the requirements of the mines for a steady all the year round supply of vegetable food. The mining industry, independently, desires railways for its fuller development, which in turn will give the farmer a good local market for perishables as well as for staple crops. At present, while prices for these commodities are high the demand is extremely limited and too erratic to cater for systematically. This satisfies neither producer nor consumer. However, in this direction prospects are bright, for mining activity in its early stages is observable everywhere, and the farmer lives in hopes of townships, or at least stations, almost at his door, and of mines—preferably on the adjoining farms. Naturally the close contact of the farming and mining interests leads at times to difficulties, but the advantages of a “live and let live” policy are so obvious that nothing is likely to be allowed to arise to the serious detriment of either.



Possible Rotation Crops for Southern Rhodesia.

BOTANICAL EXPERIMENT STATION RECORDS,
1909-1910.

By H. GODFREY MUNDY, Agriculturist and Botanist

The Botanical Experiment Station, Salisbury, is situated on the Commonage north of the Polo Ground and west of the B.S.A. Police Camp. The soil is very uniform, and consists of the strong red loam common to this part of the Salisbury district. In depth it varies from four to seven feet or more, and gradually merges into a stiffer subsoil. The following is the analysis of the surface nine inches of *virgin* soil made by the Agricultural Chemist:—

Mechanical Analysis—air-dried soil.

			Per cent.
Coarse gravel	...	over 3 m.m.	0.26
Fine gravel	...	... 1 —3 m.m.	0.89
Coarse sand	...	... .2 —1 m.m.	9.36
Fine sand	...	... .04— .2 m.m.	29.05
Silt	...	... .01— .04m.m.	16.66
Fine silt and clay	...	less than .01m.m.	29.21
Loss on ignition (water and organic matter)	...		14.54
Calcium carbonate	...		0.03

Percentage Composition of Fine Earth (portion passing through a 3 m.m. sieve). Air dried.

			Per cent.
Moisture lost at 100° C.	...	...	3.32
Loss on ignition (organic matter and combined water)	...	...	11.22
Nitrogen	...	...	0.05
Phosphoric oxide soluble in hydrochloric acid	...	...	0.092
Phosphoric oxide soluble in 1% citric acid solution	...	...	0.0009
Potash soluble in hydrochloric acid	...	...	0.065
Potash soluble in 1% citric acid solution	...	...	0.013
Calcium carbonate	...	...	0.03

This analysis indicates that the soil contains a fairly good supply of available potash, but is very deficient in citric soluble phosphoric oxide, and also in nitrogen and lime.

Rainfall returns were registered on the Station from February, 1910 onwards, and between this date and the end of April 14.91 inches fell. At the Gaol 15.44 inches fell between September 1909 and the end of January, 1910, so that presumably the total fall on the Experimental Station was about 30.35 inches.

Work on the Station was not commenced until June, 1909, when the land was broken up with a disc plough. As is common knowledge, soil of this character is exceedingly hard to break in mid-winter, and owing to the scarcity of rain in early spring, it was found impossible to bring the soil to a really good tilth by the middle of December when sowing commenced—many of the clods were still very lumpy and the greater parts of the roots of grasses and perennial veld plants were undecayed.

In considering the results of the experiments, these facts must be taken into account, and also that red soil of this character seldom gives wholly satisfactory results the first year.

Many of the plots, such as sisal hemp, Mauritius hemp, New Zealand flax, caravonica cotton, cassava, castor oil, and so forth, will not come into full bearing for two or more years, and a discussion of these will therefore be reserved for a later report.

On all sides the complaint is heard that some other crop besides maize is required, and the object of this article is to draw the attention of farmers to those crops which promise well and of which seed is now available for co-operative experiments. With our present knowledge it is impossible to say definitely what crops are best suited to each individual farm or district. The final decision must rest with the farmer, but by testing the different crops on a small scale, more can be learnt of the actual possibilities of a soil than by any other means.

LEGUMINOUS CROPS.

Lucerne.—In the past many attempts have been made in Southern Rhodesia to establish dry-land lucerne, and though

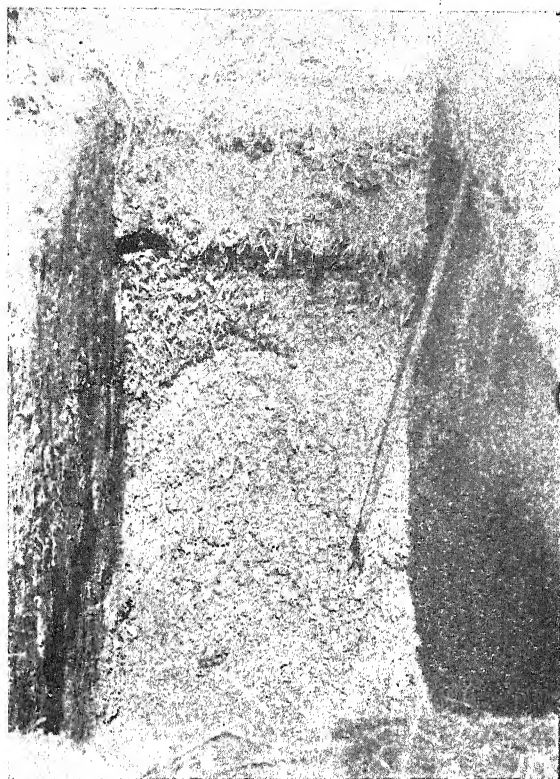


Plate 1.—Pit Silo, showing earth sides, and covering of earth and grass.

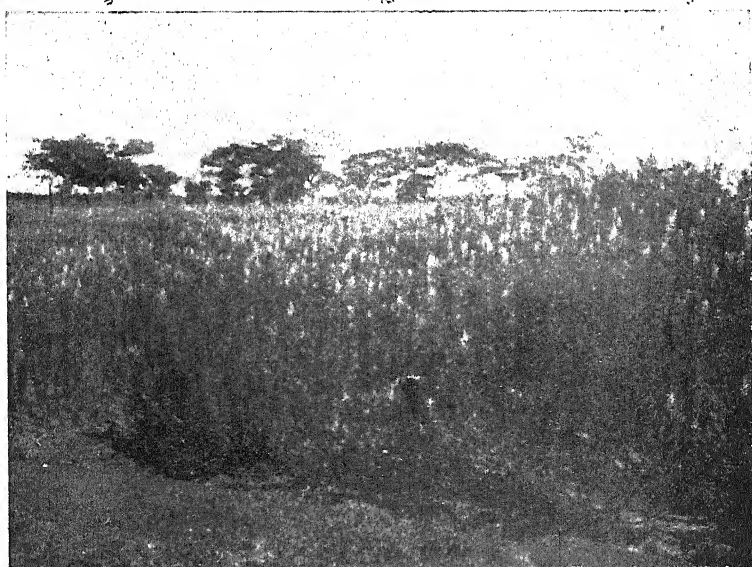


Plate 2.—Blue Lupins (*Lupinus angustifolius*)

some of these have proved satisfactory for the first two years, the final results have usually been disappointing. Many of the failures may be attributed to the fact that damp water-logged soils were thought to be suitable for the crop. This, of course, is not so. Two of the important factors in a good lucerne soil are depth of open subsoil and absence of water-logging at any season of the year. On account of possessing these two features, it was thought that the red soil of the Salisbury district might prove adapted to lucerne, and an initial experiment was made in establishing half an acre of this crop. Provence lucerne seed was drilled in rows 15 ins. apart on the 26th December and, in spite of shortage of rains in January, a good stand was obtained. Probably owing to rawness of soil, growth was slow, and no cutting worth mentioning was obtained this season. Part of the plot has been limed at the rate of about 300 lbs. per acre, and a similar dressing will be harrowed in just before the rains commence. A small part of the plot was treated with nitro-bacterine culture applied in liquid form when the plants were about six inches high. At the time of writing, no appreciable difference has been observed between the different plots, but this may probably be more noticeable next summer.

Egyptian Clover (Trifolium Alexandrinum).—The opinion that dry-land lucerne cannot be profitably grown in Southern Rhodesia is so frequently expressed, that it seemed desirable if possible to find some other fine strawed leguminous crop which might be used as a substitute on soils unsuitable to lucerne and which could be grown in rotation with maize. Egyptian Clover was sown broadcast on December 30th on a $\frac{1}{4}$ -acre plot at the rate of 15 lbs. of seed per acre. From the first the crop did well, and at no time suffered from drought, finally reaching a height of about 18 inches. It was cut on April 10th and gave a yield at the rate of 3,172 lbs. of partially dried fodder, or rather more than one ton of cured hay per acre. Three weeks after cutting the aftermath was six inches high, and remained green until the end of May when it had reached a height of nine inches. The success of this crop on raw land and in an unfavourable season was so marked that a larger acreage will be laid down this year, and by sowing in the middle of November, it is hoped to obtain two cuttings in addition to a good aftermath. Should next year's

experiments endorse those of the past season, it seems probable that Egyptian Clover will prove a good summer rotation crop with maize—producing a fodder of higher feeding value and market worth than oat hay, and in addition, an excellent late summer grazing especially suitable for sheep or dairy cattle.

*Velvet Beans (Mucuna utilis) and Cowpeas (Vigna catjang).—*The success of these crops in other parts of South Africa led us to believe that they would do equally well, if not better, in Rhodesia. Half an acre of each was planted on December 23rd, the Velvet Beans being spaced 4 by 2 feet apart, and the Cowpeas 3 by 1 foot apart. The variety of Cowpea grown was "Wip-poor-will," and in addition large acreages of both crops were planted on the Experiment Farm, Gwibi. The experiment was intended as a comparative trial between the two crops, and there seems little doubt that the Velvet Bean is the more valuable, making a better growth and yielding far more heavily. Other varieties of Cowpeas will be tested this season, but where the period of maturity is no object, as is the case in most parts of Southern Rhodesia, the Velvet Bean is undoubtedly the better crop. The yield of cured hay was at the rate of $1\frac{1}{2}$ tons per acre, and on the Experiment Farm, Gwibi, cattle refused to touch either Boer manna hay, Teff-grass hay or Veld-grass hay as long as they could gain access to a bite of Velvet Bean hay.

Part of the crop was cut green and converted into silage mixed with maize stalks and veld grass, and plate No. 1 shews the miniature pit silo on the Botanical Experiment Station, Salisbury, measuring 9 by 6 by 4 feet. These trials supported by reports reaching us from other parts of Southern Rhodesia confirm the opinion that Velvet Beans can unhesitatingly be recommended to Rhodesian farmers who are desirous of growing a heavy yielding leguminous crop suitable either for dry fodder or ensilage. The distance of planting should be 3 by $1\frac{1}{2}$ feet, and about 25lbs. of seed will plant an acre. At this spacing the crop covers the ground well, requires practically no cultivation, and on foul land will prove an effective smothering crop for weeds. It is a matter of interest that whereas Cowpeas made a proportionately weak growth in comparison with Velvet Beans, the

former produced nitro-bacteria nodules in quantity, while none could be found on the latter.

Lupines (Lupinus spp.).—Three varieties of Lupines were tested, namely, the White, the Blue and the Yellow. All did well, and although the yellow proved the earliest, the blue appears to be the heaviest cropper. Lupines are naturally suited to sandy soils, and, as there is none such on the Experiment Station, the results are not entirely conclusive. It would seem however that for most soils they have no superiority over Velvet Beans, while possessing the disadvantage of increased cost of seed and the fact that they cannot be made use of to any extent for feeding purposes. The value of the crop on sandy soils however yet remains to be proved, and this may be as a rotation crop with tobacco. Plate No. 2 shews the growth of Blue Lupines (*Lupinus angustifolius*).

Ground Nuts (Arachis hypogaea).—I have already indicated the value of this crop in an article on Ground Nuts appearing in the *Agricultural Journal* of December, 1909. To a country possessing such large tracts of comparatively poor sandy soil, the Ground Nut appears likely to prove of very considerable importance as a source of oil when local factories arise, as a necessary and cheap adjunct to the rations of natives employed both on the mines and on farms, as a rotation crop, and lastly, but by no means least, as a nutritious feed for both cattle and pigs.

A comparative trial was made between the local variety grown by the natives and the Virginia Mammoth; a sort usually producing a heavier crop and a larger nut of better appearance for human consumption.

As has already been stated, the crop revels in a light sandy soil, while that on the Experiment Station is a strong loam. Seed was put in on the 23rd December in drills $2\frac{1}{2}$ ft. apart, the 2 to 3 shelled nuts being dropped at intervals of 18 ins. apart. During the early stages of growth the plot was cultivated with a Hallock weeder, and just before flowering commenced the rows were slightly ridged up. In the heavy soil the nuts were slow to mature, and reaping was not commenced before the middle of July. Previous to this, and after the maize cobs had become too hard for their taste, crows were a source of constant trouble, and as the plots were only

one quarter of an acre in area, a considerable amount of damage was done. On estimating the average yields, the local nut produced $5\frac{1}{2}$ bags (bag equals 82lbs.) and the Virginian Mammoth $8\frac{1}{2}$ bags per acre, while the nut produced by the latter was far superior to that produced by the former. These returns are comparatively small, which can be accounted for by the depredations of crows and unsuitability of soil, but there seems good reason to think that the Virginian Mammoth will prove the heavier cropper and the more profitable to grow. Several other of the best American varieties will be tested this coming season. All admit the need of a good rotation crop for sandy soils, and with machinery for harvesting and shelling the nuts, the crop is one which deserves far more attention than is at present bestowed upon it.

Sweet Potatoes (Ipomoea batatas).—Three plots are under trial with this crop, two of the best varieties from Natal being tested against the local variety, which is already grown largely by the natives in various parts. The comparative results are not conclusive, but one has little hesitation in saying that no Rhodesian farm should be without a patch of sweet potatoes. The crop is easily grown, will thrive on nearly all soils, and once established is permanent as far as propagation, either by tubers or slips, is concerned.

Where local mines offer a market, good prices for the tubers can often be obtained, while in addition, when properly cooked, they prove a culinary asset which few farms can afford to be without. The tubers are well known as an excellent feed for pigs and cattle, and the vines are good green feed for any class of farm stock, or might be mixed with maize stalks and converted into silage.

Many farmers are now turning their attention to pig rearing, and to such, a good field of sweet potatoes might well be one of the first considerations.

SUMMER FORAGE CROPS.

Boer Manna (Setaria Italica) and Japanese Millet (Panicum crus-galli).—A comparative trial was made of these two crops, and on red soil, as was to be expected, the results were all in favour of Boer manna. Seed was sown broadcast on

January 1st at the rate of 15 lbs. per acre. Three weeks' drought followed, during which a considerable proportion of the seedlings were burnt off, and a thin stand resulted. Boer manna withstood the drought best, and yielded a crop of dry forage at the rate of about three quarters of a ton per acre, being cut five months after the date of sowing. Japanese millet, which is a quicker maturing crop, was cut four months after sowing, and gave less than half a ton of dry fodder per acre. On wet, ill-drained land, the latter forms an excellent heavy yielding summer forage, and, unlike Boer manna in Southern Rhodesia, is not to any extent subject to rust. As a fodder it is equal, if not preferable, to Boer manna.

The beneficial effect of Boer manna in rotation with maize is common knowledge, and for this reason alone farmers should pay greater attention to it. In many cases it would be more profitable to break in the land with a crop of manna—relying on the improved yield of grain the next year—rather than to plant maize late in the season on ill-prepared land. Where the soil is sour and liable to become excessively water logged in summer, Japanese millet should take the place of manna.

Teff Grass (Eragrostis abyssinica).—On the well managed farm each crop that is grown appears in the rotation for some definite purpose. The place of Teff grass is as a cleaning crop on old lands which have been thrown out of maize cultivation, or as a green manure crop. Reference has been made in a previous article to the difficulty of curing natural veld grass hay in good condition. It is commonly admitted that much of our hay is either coarse and dry before being cut, or if cut at the right stage, the risk of damage by rain is considerable. Teff grass is a quick maturing annual crop and is generally sufficiently high for hay making in three to three and a half months after sowing. If sown early, two cuttings can often be obtained, as well as an excellent aftermath, invaluable for sheep, milch cows, and calves. On the Experimental Station, two half acre plots were sown to this crop on January 13th, and ten weeks afterwards were cut for hay, yielding at the rate of one ton per acre of first-class fodder. Three weeks later the aftermath had reached a height of 6 to 8 inches, and there seems no reason to doubt that had the crop been sown in December two good cuttings of hay would have been obtained. The stalks are fine, and

while there is plenty of leaf growth, the hay is easily cured. Seed is sown at the rate of 5 lbs. per acre mixed with about eight times its bulk of sand. On land expected to be very foul with weeds, rather a heavier seeding is advisable, and if at first the weeds appear to be getting the mastery of the Teff grass, the position will quickly be reversed if a mowing machine is run over the land and the weeds topped. Treated in this manner the writer has seldom known Teff grass to fail as a cleaning crop, and can therefore recommend its use to all Rhodesian farmers who wish to avoid the "one year seeding seven years weeding," which is entailed by the present practice of abandoning fallow lands to weeds and comparatively worthless grasses.

Summer Wheat.—Various attempts have been made in the past to grow wheat during the rainy season. Many of these have failed either from sowing in the wrong month or from using the wrong kind of wheat. Two kinds were experimented with this season, namely, Bobs Rust Proof and Victoria Wheat—the latter is largely grown on the Transvaal Highveld during the rainy season.

In order to counteract the rawness of the soil, a dressing of three tons of kraal manure was applied per acre about four weeks before sowing. Seed was sown broadcast on January 10th at the rate of 45 lbs. per acre and a good stand resulted. Victoria Wheat was slightly freer from rust than Bobs, but neither suffered to any extent, and both varieties grew from $2\frac{1}{2}$ to 3 feet in height. Bobs is slightly the earlier of the two, and when reaped five months after sowing yielded rather more than three bags, *i.e.*, 10 bushels per acre. Victoria wheat was cut three weeks later and returned $2\frac{1}{2}$ bags of grain per acre—in both cases the grain was of excellent quality, but owing to the smallness of the plots ($\frac{1}{4}$ acre) no little damage had been done by birds, and the recorded yield is therefore smaller than it would otherwise have been. Three acres of Victoria wheat sown on the Experiment Farm, Gwibi, also gave good results, and two good exhibits of summer grown Bobs Wheat competed at the Salisbury Agricultural Show.

There are many factors governing the successful growing of summer wheat in this territory, and that good results have been obtained this season is no criterion that the crop can be

depended upon. It is nevertheless of such importance to find other readily marketable crops besides maize, that these experiments will be conducted on a much larger scale next year. In the writer's opinion, situation and time of sowing are of the first importance. A strong well-drained loamy soil appears the most suitable, second or third year land being preferable. The situation should be as high lying as possible and black vleis do not appear desirable for summer wheat. Seed should not in most cases be planted before the 1st January, and from the commencement of the rainy season to the time of sowing, the land should be kept harrowed and free from weeds. The object of this treatment is to conserve as much moisture as possible, and to defer the "piping" of the plants until towards the close of March. It is usually during the piping stage that these wheats are most susceptible to rust, and drier atmospheric conditions from this period onwards seem beneficial. Plate No. 3 shews the standing crop of Bobs wheat, and No. 4 Victoria wheat in the stook.

Similar experiments were conducted with Algerian Oats, but this variety appears too slow to mature to prove a successful summer oat. Sidonian Oats are largely grown in some parts of South Africa as a summer crop, and are likely to prove more satisfactory, though extensive trials must be carried out before the crop can be recommended for sowing on any large scale.

Linseed (Linum usitatissimum).—This crop has been grown for some years in Rhodesia, though more or less on an experimental scale. That it thrives well and crops heavily has now been proved beyond doubt, and we learn of one farmer who, on 13 acres has grown 3,000 lbs. of seed and disposed of the bulk of it at three pence per pound. In this case the seed was sown far too thinly or the resulting crop should have been much heavier. Linseed requires a good rich soil, and cannot therefore, like Boer manna, be recommended as a rotation crop for partially exhausted maize lands. The grain is invaluable on a farm for feeding in small quantities to cattle, mules and horses, and more particularly when dairying is practised, either as a mixed ration for milch cows or for use with separated milk in calf gruel.

A half acre plot on the Experiment Station, sown broadcast at the rate of 20 lbs. of seed per acre gave a return of $1\frac{1}{2}$

bags, *i.e.*, 300 lbs. of clean seed, and was harvested $4\frac{1}{2}$ months after sowing. Seed may be sown any time during the rainy season up to the middle of January, but owing to uneven ripening the first matured seed will be shedding before the latest formed flowers have set seed. As with buckwheat, the crop should be cut either by hand or with a mower, during the early hours of the morning, and should then be tied in bundles and stooked. Threshing is done either with a machine or by beating with sticks, or by the ancient method of treading out with cattle. Linseed straw is of fair feeding value, and after threshing, cattle will eat both chaff and straw with avidity. The crop is one which should find a place on every Rhodesian farm.

Change of crop or rotation is now recognised as one of the secrets of good husbandry, and though with our limited markets none of the above crops are at present likely to take the place of maize, yet it is hoped that the foregoing notes may be helpful to farmers by indicating some of the crops which can be grown on a small scale for local consumption, an increased acreage of which we may reasonably expect in the near future to become profitable.

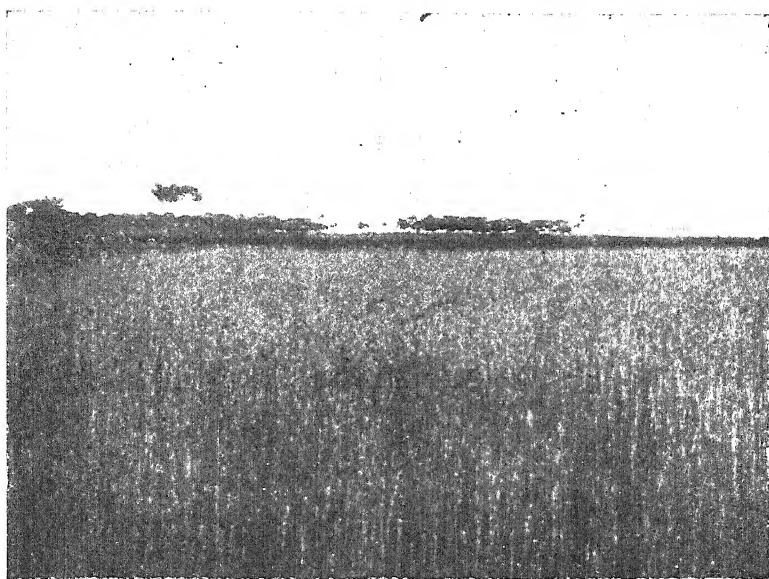


Plate 3.—Bobs Wheat.



Plate 4.—Victoria Wheat in the stook.



Imported Hereford Bull, "Mounford Ringleader," the property of Mr. R. Granger, Monaro, Rhodesia.

The Hereford Breed of Cattle.

By R. GRANGER, Monaro, Figtree.

Having had a Hereford bull for not more than two years it is rather soon to be able to decide as to what his progeny are going to be like, but so far as one can see they are at least twice the weight of calves of the same age bred from cross Afrikander and Friesland bulls, with which they are running. I have given them all exactly the same treatment, milking the mothers once a day, not a bit of artificial food, and they are out in all weathers day and night, and are in just as good, or if anything better condition, while being bigger in body and better in shape. The bull ("Mountford Ringleader," imported by Mr. Hay) came from Mr. T. Minton's well-known herd, and has so far been absolutely free from sickness of any sort. He runs with the cattle all the year round, getting a few crushed mealies night and morning more to keep him tame and easy to handle than from any necessity to feed, as many days he comes in so full that he refuses to touch the feed given him. Yet his condition is all that could be desired, and in spite of his weight—estimated by some at 2,000 lbs.—he never shows the least sign of being tired or foot sore, and must in the course of the day travel many miles, being out from 8 a.m. till dark.

It has always appeared to me that in selecting a breed to cross with our native cattle we want one that will give size and early maturity while at the same time in no way impairing the natural hardiness of the native breed; and in addition one requires improvement in shape—more meat where the butcher wants it. If, further, we can get a beast resistant to diseases, making a good trek ox, one that can live on the veld and keep his condition where other breeds can barely exist, then in selecting the Hereford, which combines all the above good qualities, one can hardly go wrong.

It may be thought that the above is slightly exaggerated, but if you will kindly read the following extracts from "The History of the Hereford," by Messrs. McDonald and Sinclair, you will see that besides the above, the breed possesses great

possibilities as a milking straight prolificacy and, also longevity, producing calves to a great age.

Marshall, in his "Rural Economy of Gloucestershire," writes: "In general appearance the Hereford cattle resemble very much those of Sussex, except in their superior size. Their frame is athletic and the form of many of them as beasts of draught is nearly complete."

Mr. E. J. Morris, Stapleton Castle, writes: "They (the Herefords) are generally more docile and placid than most breeds. Another trait in their favour is their comparative freedom from disease. Although I have bred and owned some hundred of cows, I never knew a Hereford cow have milk fever, or drop after calving, so common a trouble amongst Shorthorn cows. Another point in favour of the Hereford cow is her power to bear age. At 10 years old she looks no older than a Shorthorn at half the age. It is nothing uncommon for cows of this breed to arrive at 20 years of age and breed regularly. It is said that old Governess lived to be 33, and only a few years before she bred the twin bulls Zeal and Zealous."

Mr. J. R. Hill, Ouleton Hall, says: "In view of the fact that they are practically free from tuberculosis, a circumstance no other breed can boast, the demand for them must increase in all beef raising countries of the world."

Mr. F. C. Giltner, Kentucky, answering a question as to the demand for Herefords in the United States, wrote to "The Breeders Gazette" of April, 1908: "The demand for Herefords comes from every section, as they seem to thrive in every climate and under any condition. Ranchmen are the largest buyers of bulls, the farmer and breeder the principal purchasers of the females. As grazers, no breed of cattle approaches them, and their ability to fatten on a grass diet of their own gleanings is a quality which appeals to those who are looking for the most economical method of producing beef. Herefords naturally mature early, from 20 to 30 months being the time required to produce 1,300 to 1,800 lbs. of beef that will top any market. As a breed the Herefords are prolific and prepotent, and will give Hereford markings to 90 per cent. of their offspring. Both sexes remain fertile and reproduce up to the age of 20 years."

In Mr. Duckham's Record, among other things, he says: "The cattle feeders along Connecticut River stated that after they had fed some half-bred Hereford oxen they would gladly pay 5 to 10 dollars a head more for them than for other cattle of equal size and condition, knowing they would be amply repaid for the additional cost in the gain the animals would make for the food consumed, and in the extra price the beef would bring."

Messrs. McConnell & Wood, of Brisbane, wrote in 1885: "We have had a great opportunity of observing the development of the Hereford cross. In years past we owned a very well bred herd of Shorthorn cattle, the direct descendants of imported stock. They were very superior cattle of splendid quality, rich colour, with big bodies on short legs. In a few years the constitution gave way; the cattle became sickly, light in the fore rib, and lighter in colour, in spite of changing the bulls. In 1872 it was decided to introduce Hereford bulls altogether, and the breed adhered to; this was closely followed and the result has been more than satisfactory. We now own 7,000 head of Hereford cattle with capital constitutions and handsome appearance. We handle and wean a greater percentage than of old, the cattle are quieter, and we can keep a greater number on our freehold. The cattle are vigorous, fat and hardy from the start, and we are confident there is no breed like them for accommodating themselves to the changes and chances that grazing cattle are exposed to in this capricious and uncertain and often rainless Australian climate. There can be no doubt that a Hereford is more agile in his movements than any breed except the Devon. That I concede readily, and I hold it to be one of his excellencies, for it enables a grazing Hereford to range for food in times of scarcity and do well when a softer breed gives up the struggle for existence."

Mr. Angas, of Collingrove, New South Wales, says: "At Collingrove, although the Herefords had the poorest paddock, they were wonderfully fat, and at the same time very regular breeders. The hardy character of these cattle for travelling long distances as well as for road and farm work, is well known in the Colonies, as well as at Home."

Mr. Douglas, of Mount Maria, Queensland, says, "I am strongly impressed by their constitution, docility, early

maturity and profitable qualities. I found them good goers on roads, they travelled well and were quiet."

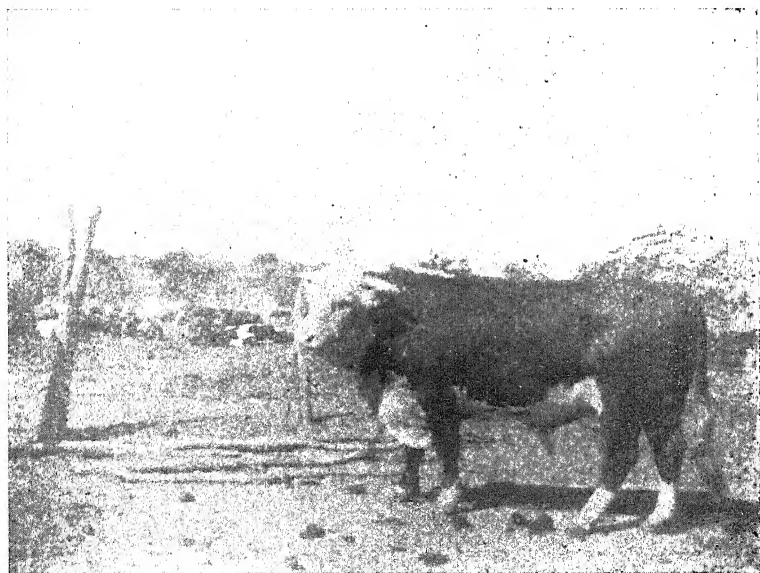
Hereford cattle have likewise made their way into Jamaica, where, as in other distant countries, they adapted themselves to the strange surroundings with wonderful facility.

Mr. J. Edwards, of Knockalva, says, "The Hereford steers proved to be excellent working stock, a qualification absolutely necessary for Jamaica, as they are required for the sugar estates. For fattening purposes no breed can successfully compete with them, as the numerous prizes won at the shows abundantly manifest. As to the hardiness of the Hereford cattle, I have had abundant opportunities of knowing that no breed is equal to them in that respect."

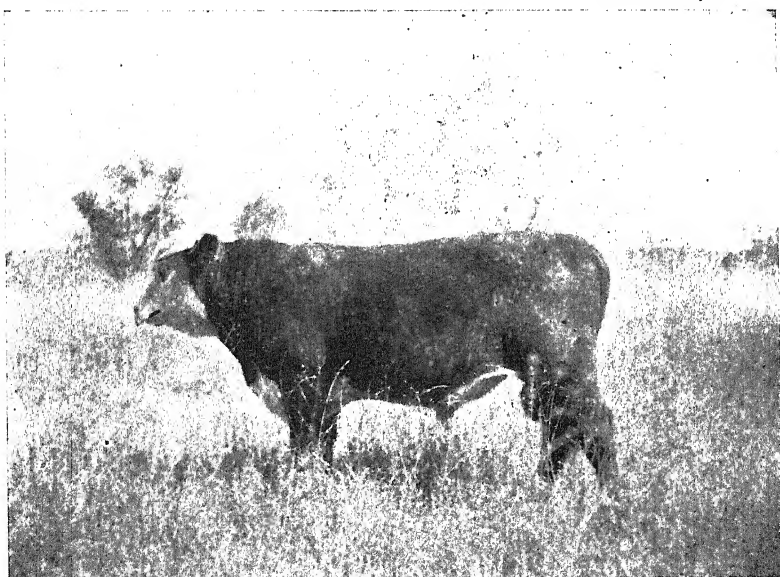
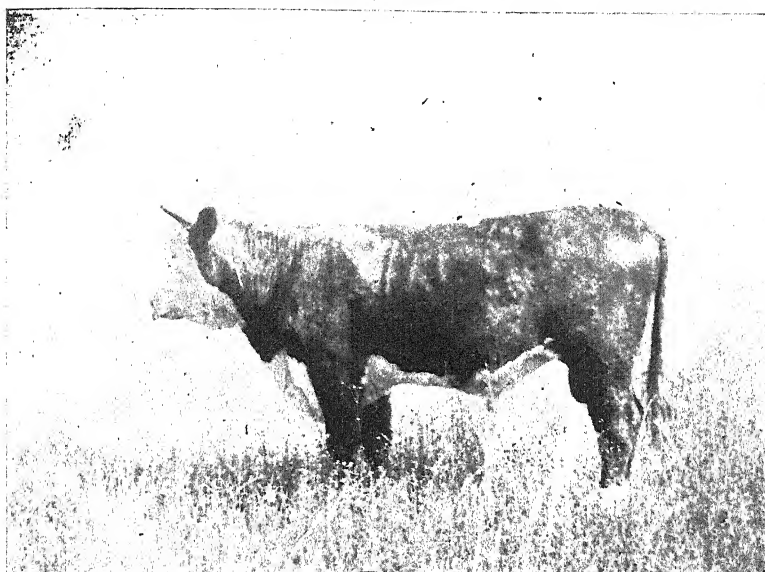
Mr. Stuckey, of New Zealand, says, in 1888, "My Hereford cattle are of splendid constitution. They are always out and never have any artificial food. The more I see of Herefords the better I am satisfied with them. My steers go to the butcher at $3\frac{1}{2}$ years of age, running with the sheep, making the country (*i.e.*, breaking down the fern and scrub and pulling out any mops of grass that may grow)."

Mr. W. Tudge, of Summer Court, writes, "Another very material point in their favour with the home and foreign markets, is their freedom to pass the tuberculin test, for scarcely one per cent. of Herefords fail when other leading breeds often have 30 per cent. that fail to do so. If farmers went in more for Herefords, the butcher would have no occasion to ask for a warranty, for the Hereford is practically a warranty in itself. As regards their milking qualities, there are always a few good milkers in every Hereford herd, and, if required, bulls could always be had from some of these, and it is entirely a mistake to think that there are not good milking Hereford herds. I will instance one in particular that has proved it, *viz.*, that of Mr. White, of Zeals, Wiltshire. His large herd (about 80 cows) has gained prizes given for the best milking herds in the South of England in comparatively large classes, and I feel sure that if all the merits of the Hereford breed were more fully known they would be thoroughly appreciated and would become the leading breed of cattle in this and other countries."

Mr. James Mappowded, Blandford, Dorset, kept a herd of 100 cows which he let to dairy people. He has tried Short-



Hereford Cattle in Rhodesia.
Two imported bulls,



Imported Hereford Bulls in Rhodesia.

Banana (15 months old) and Henry (13 months old)
Both the property of Mr. C. L. Jobling, Devonby, Rhodesia,



Imported Hereford Heifers (15 months old).

Photographed 9 weeks after arrival.

The property of Mr. C. L. Jobling, Devonby, Rhodesia.




horns and Devons with the Hereford, and found that the last named fattened faster and were of a much hardier constitution than either and therefore better adapted for grazing.

Mr. Jameson, writing in 1884, said the same system was pursued, and the Herefords were as great a success as ever. He and his father had kept and bred Herefords for dairy cows, for 48 years. He had won a number of prizes for dairy cows and for dairy cows and offspring, against Devons and Shorthorns. The butter was of splendid taste and colour.

Sir John Catterell, after describing the management of the Garnon's herd, says, "That the breed is the cheapest beef-making one I do not think is questionable, and I hope and believe that it has a great future before it. Perhaps more especially in Africa. I was travelling the other day, and a friend of mine who did not know I was interested in the breed, pointed out of the window to a bunch of Herefords grazing, and said, 'Ah, those are the fellows for Africa; my son, who is in East Africa, tells me that they are the only cattle that do!' Such unsolicited testimony to the excellence of the breed cannot but be very gratifying to a breeder."

The above extracts are, I think, sufficient to show that in all parts of the world the Hereford has shown the same qualities of hardihood and ability to fatten on grass, and has proved an undoubted success, and seeing what a grand grass country we have in Rhodesia, I think it quite safe to prophesy that they will do equally well here.



Notes on the Bovine Plasmoses of Southern Rhodesia

WITH SPECIAL REFERENCE TO MASHONALAND.

By L. E. W. BEVAN, M.R.C.V.S.

From the *Veterinary News*, Vol. VII., No. 342.

In the indigenous cattle of the country, Rhodesia has a valuable nucleus upon which to build up her stock industry. These animals are certainly small, but "kill" well; they are healthy, acclimatized, and more or less resistant to the diseases of the country; they are prolific and respond readily to better blood, and seldom suffer from any difficulty in parturition, even when mated to a bull of far larger type. But it is admitted that these animals, as they are, cannot hope to take a place in the meat markets of the world, but will require careful and systematic improvement by mating with high-class animals, which will necessarily have to be obtained from the adjoining South African Colonies, or from overseas.

On account of the danger of introducing disease it has been forbidden by law to import cattle from any of the southern colonies except the Cape Colony or the Orange River Colony, and, unfortunately, the animals obtainable from these colonies are seldom of very high quality, since such are not so numerous that owners can afford to part with them. These drawbacks tend to counter-balance the benefits associated with partially acclimatized stock.

Importation from overseas would, therefore, be the system to adopt, were it not for the unfortunate fact that the great majority of animals succumb shortly after arrival from one or other of the plasmoses of the country. The more fortunate which survive have also received a very severe "set-back," and their growth and usefulness is retarded.

As far as can be ascertained from the limited amount of laboratory work at present performed here in connection with these diseases, the indigenous cattle of the country act as "reservoirs" of the *Piroplasma bigeminum*, *Anaplasma mar-*

ginale (Theiler), and possibly *Piroplasma mutans*. These parasites, while apparently innocuous to local stock, give rise to acute infections in non-acclimatized and non-immune cattle.

All bovines in this country are also susceptible to African Coast Fever, which is due to infection by *Piroplasma parvum*, but, as far as we know, indigenous and imported cattle are equally susceptible to this disease, which generally takes on an acute form.

The small percentage of animals which recover are not supposed to act as reservoirs of the virus, although the immunity conferred by one attack is of many years duration. Recent experience has shown that animals which "salted" in 1902 are to-day (1910) proof against severe re-infection.

But it has been known for some time that animals imported from Great Britain, and even from non-redwater areas of adjoining colonies, almost invariably contract, soon after arrival in this country, an attack of "redwater," and that those which recover later on suffer from a second sickness generally referred to as "the second redwater reaction," but which, from recent observation, would appear to be connected with the presence of the so-called *Anaplasma marginale*. Those animals fortunate enough to survive are liable to recurrences, from which a larger portion succumb. In practice it has been found advisable to import stock during the winter months, when ticks are less plentiful, but it has often happened that after the animals have suffered from a mild attack of fever at that time, they have contracted a more virulent and perhaps fatal attack later on, when ticks have become more abundant.

It is a very remarkable and unfortunate fact that thoroughbreds and half-bred cattle are far more susceptible to tick infestation than are the indigenous or South African varieties. As far as the writer knows no satisfactory explanation has been advanced to account for this. Similarly, animals in poor condition or in bad health are more victimised by ticks, and there would appear to be a most unfortunate co-operation between the ticks and the diseases they give rise to, for while the ticks transmit the parasites which are the cause of the sickness, the sickness brings about a dry, unhealthy condition of the skin which appears to be favourable to tick invasion. It

would thus appear that the severity of the disease is in some way related to the number of ticks, or, perhaps, the immunity conferred by the first attack is used up or broken down by constant re-infection.

Again, the intensity of the virus appears to differ in various localities.¹ It is more severe on places where a large number of cattle have been grazed for a long time, and, as might be expected, it is found that the plasmoses are more severe on the commonages, and that the severity bears a close relation to the amount of interchange of cattle between the commonages and the outlying farms; so that on farms belonging to dairymen and transport riders, whose animals are continually passing to and from the commonages, redwater infections are most severe.

The virus also appears to become exalted by passages through animals of improved blood. With local cattle submitted to infection since birth an immunity is early established, and the disease exerts little, if any, effect; but calves of improved breeds, in direct relation to the proportion of native to improved blood, suffer far more severely. Where imported animals have from time to time been introduced, as in the case of dairy herds, the strength of the virus has gradually increased.

Passage through imported animals, especially those over a year old, seems to afford the greatest exaltation.²

1. Theiler, in a recent letter to the writer, has expressed his opinion that "we have different sorts of redwater, and one does not mean immunization against another. It is only in this way that we can explain the occurrence of redwater."

2. In this connection it is interesting to note the history of the virus used by Nuttall and Hadwen in their experiments on bovine piroplasmoses. Larvæ, *Boophilus decoloratus*, obtained from South Africa were placed on a three months' old calf, which did not develop symptoms. No *Piroplasma bovis* were found in its blood, which, however, was capable of infecting a yearling bull of which a few *P. bovis* were detected. The blood of this bull inoculated into a heifer gave rise to severe piroplasmosis, and a further transference from this heifer to another produced a similar result. Twenty months after, a cow was inoculated with 3 c.c. of defibrinated blood from the last heifer, and, failing to react, was re-inoculated after 13 days with 200 c.c. of blood from the same source. The cow showed parasites on the sixteenth day after the first injection. From this cow nine others were inoculated, all of which reacted more or less severely. Five of these were treated, but one, untreated, died of redwater."—"Parasitology," vol. ii., No. 3, p. 237.

Until recently it was not determined whether the Mashona-land virus was a bigeminum infection alone or a mixed infection made up of *Piroplasma bigeminum* and one or more of the plasmoses mentioned before. Nevertheless, on the basis afforded by practical observation, an artificial inoculation was attempted, and, as might be expected, with varying results. When the greatest care was taken to select the virus from an animal which on the above lines might be calculated to yield a mild strain, fatalities following inoculation were less severe than when blood was taken haphazard without the application of these principles. But recovery from a mild type of the disease often gave rise to a false sense of security and tempted the owner to expose his animal to more heavily infected veld, where the immunity proved insufficient and broke down under gross natural infection. Latterly, therefore, the writer has followed up recovery from a mild infection by re-inoculation with a virus of greater intensity, the results proving more satisfactory. Such a system, however, must always be unsafe and unsatisfactory, for there is always the risk that in selecting the virus one may stumble across an animal in which the strain is unexpectedly severe. Obviously the only satisfactory method would be to standardize the virus by using only animals constantly under observation since birth and submitted to a regulated natural or artificial infection with virus of known type. Until this be done, the introduction of high-class cattle will remain a highly speculative undertaking.

In practice, what has been roughly diagnosed as "red-water" has been held to assume one or other of the following forms: (1) Fever and hæmoglobinuria; (2) fever and malignant jaundice; (3) anæmia. The presence of hæmoglobinuria is not regarded as an indication of the severity of the disease, but so long as appetite and digestion are maintained cases where it occurs are regarded more hopefully than those where jaundice is the predominant feature. The recent advances in the study of the bovine plasmoses have made it advisable to determine which of the protozoa are present in the cattle of this country, and for what symptoms each is responsible. The following case has a bearing on these points, and is therefore discussed at some length.

Subject.—A yearling Devon bull, the property of Mr. H., Salisbury, which arrived by rail from non-redwater karoo veld on February 9, 1910. Depastured at the Inoculation Camp for the tuberculin test (there being no reaction). Thence taken to Mr. H.'s residence, Salisbury, there stabled and groomed. Received at the Laboratory February 16, 1910.

Virus.—Blood was obtained from a nine-months-old heifer, running since birth on an outlying farm. The blood was taken from the jugular vein of the heifer about mid-day of February 20, was citrated, and was injected into the bull on the following day.

Reaction.—Elevation of temperature manifest on the sixth day, which did not persist. After a decline it recommenced on the ninth day. This elevation was coincident with a reduction in the number of the red blood-cells, which fell from an average of $5\frac{1}{2}$ millions per cubic millimetre to 5 millions.

The temperature crisis of this reaction was reached on the thirteenth day, the blood count average becoming progressively lower until that day, but subsequently improving until the twentieth day, when a count of 4,900,000 was again recorded.

Both temperature and blood changes were influenced by the administration of drugs, as will be noticed later. About the twenty-fourth day a high temperature again occurred, but this was attributed to an abscess which had formed at the seat of injection of the drugs.

A second reaction commenced on the twenty-ninth day, and continued for about fourteen days.

Clinical Symptoms.—On the eleventh day after inoculation the bull appeared dull, but continued to feed; he was not seriously ill until the thirteenth day, when he passed claret-coloured urine twice. On the following day the discolouration had ceased, the urine being smoky, straw-coloured, and containing albumen.

At this time and subsequently the bull began to feed. About the twenty-third day a slight cough was heard, and some mucous discharge from the nose was observed, while the breathing became daily more laboured and rapid. The pulse also became weak, and at this stage the animal grew very thin and weak and required careful feeding and nursing.

No constipation or symptoms of biliousness, or complete cessation of appetite, occurred at any time: that is to say, *the symptoms of gall-sickness were not noticeable*. With the decline of the second temperature, recovery commenced.

Parasites and Blood Changes.—On the tenth day no parasites could be seen, and the red blood-cells were normal in size, shape, and colour affinities, but on the next day typical forms of *Piroplasma bigeminum* were encountered. On an average, in a smear of blood taken from the ear, and thinly spread, and observed under a 1-12 oil immersion and X3 eye-piece, three invaded cells to the field were counted.

On the thirteenth day a similar count showed an average of two invaded cells to the field, and a tendency towards agglutination or clumping of the red blood-cells was noted. The erythrocytes were irregular in size, some were vacuolated. Leucocytes were extremely rare, and were chiefly of the mononuclear variety.

On the next day, the temperature being as high as 106.4° F., and hæmoglobinuria being present, the red blood-cells were found to be regular in size, shape and colour reactions. An average of six invaded cells to the field were counted.

At this stage the normal course of the disease was arrested by trypan-blue, and on the following day no parasites which could be definitely recognised as *P. bigeminum* could be found. Some granular material of unknown nature was seen in the red cells. This state of affairs continued for a few days while the blood count gradually improved.

On the twenty-ninth day after inoculation a considerable number of cells contained the *Anaplasma marginale*, this increase coinciding with the unfavourable clinical symptoms previously described. The parasite remained in large numbers for the next seven days, but the average of cells involved gradually declined during this time.

On the twenty-ninth day *P. bigeminum* was again recognised. At this time blood-changes, poikilocytosis, anisocytosis, polichromasia, basophile granulations, etc., were well marked.

Although *P. bigeminum* afterwards disappeared, *A. marginale* was still recorded in small numbers, as long as fifty-five days after inoculation.

P. mutans was not encountered in this case, and the period of incubation defined by Thielér—namely, thirteen to forty-two days—having elapsed, and the animal's temperature remaining normal, it is not anticipated that it will appear as the result of the inoculation.

Since this the animal has been covered more than once by innumerable blue ticks, but no ill effects have followed, and he is therefore regarded as "salted."

Treatment.—During the last few years many drugs have been tried in the treatment of these plasmoses, but no all-round specific has yet been discovered. Of these, the most important, because of the success attending its use against canine piroplasmosis, and of "red-water" (*per se*), is *trypan-blue*. It may be mentioned that the results obtained in this country have been disappointing, but the above case throws some light upon these failures. In this animal the drug was withheld until what was considered to be a crisis had arrived, but its exhibition, in the dose recommended by Nuttall and Hadwen, was followed by the disappearance of *P. bigeminum*. As has been said before, this parasite was met with a second time on the twenty-fifth day, a circumstance in accord with Nuttall and Hadwen's experience in the treatment of both canine and bovine piroplasmosis, and of considerable interest, as it remains doubtful whether the treatment leads to actual immunity or tolerance, or only a temporary cure—a matter of some importance in practice.

The apparent failure of the drug in "field cases" can now be explained, as it was found that in the experimental bull it had little or no effect on *A. marginale*. In this case the administration of the drug on the thirteenth day did not interfere with the appearance of marginal points in vast numbers on the twenty-ninth day. It did not "shut off" the parasites already in the blood, or influence the usual period of incubation, which Thielér states to be twenty-seven to thirty-two days.

Given in quantities even greater than those recommended, *i.e.*, 2 grm. in 400 c.c. of water, and injected into the jugular vein, at the height of the infection by this parasite, no good results were obtained. The parasite did not disappear or decrease in numbers in any remarkable manner. The temperature did not decline,

Subcutaneous administration was followed by a severe abscess and necrosis of subcutaneous tissues. Introduced by gravitation into the jugular these inconveniences were overcome.

Both methods were followed by discolouration of the animal's visible mucous membranes, and the last traces had not disappeared two weeks after administration.

Methyl arsenate of soda has obtained a reputation in practice. Given by the mouth in daily doses of 1 grm. in combination with nux vomica, sulphate of iron, gentian, etc., it may help to maintain the "tone" of the animal, but observation of the blood of animals treated not only by the mouth, but also by the introduction of large doses into the vein, have shown that it does not exert any specific effect upon *A. marginale*, and little, if any, upon *P. bigeminum*.

CONCLUSIONS.

(1) That young cattle bred in Mashonaland, while themselves tolerant or immune, harbour in their blood at least two species of protozoa, namely, *P. bigeminum* and *A. marginale*.

(2) That blood taken from them and inoculated into susceptible animals gives rise to two infections. That caused by *P. bigeminum* occurs first, and that caused by *A. marginale* follows at a time when the subject is weakened by the bigeminum infection.

(3) That great care is necessary in the selection of blood for inoculation purposes. That the constitution and breed of the animal supplying the blood, its origin, and the approximate degree of infection to which it has been submitted since birth, must be taken into consideration, but that it is possible to find a blood in which the parasites are attenuated or of sufficiently low pathogenicity to produce an infection which can be regulated.

(4) That the process of immunizing cannot be conducted on mechanical lines, but that each case must be treated "on its merits." That the individual resistance of the animal to be inoculated bears an important part.

(5) That when undergoing the process of inoculation the animal must be kept free from ticks; and that, even when immunized, a gross infestation by ticks is to be avoided, as the immunity is likely to break down under severe infection.

(6) That the process of immunizing involves a severe strain on the animal's system, and checks development.

(7) That some of the drugs regarded as specifics against *P. bigeminum* are not specific against allied parasites.

Strangles.

(Nieuwziekte, *Febris pyogenica*).

By F. D. FERGUSON, M.R.C.V.S., Government Veterinary Surgeon.

This is a contagious disease of the horse due to inoculation with the *Streptococcus Equi*, characterised by high temperature and suppuration, particularly of the Sub-maxillary lymphatic glands. It is confined to the horse tribe, and is a disease of young animals, but is not infrequently met with in older animals. The disease may be Sporadic (confined to a single animal) or it may be Epizootic (a number infected at the same time).

Symptoms of the Disease.—You first notice a loss of appetite, a general dullness, temperature 104F. You rarely get an acute rise of temperature, but it oscillates as in other pyogenic diseases. The pulse is accelerated, 50 to 60 per minute; fairly large and soft. On examination of the inter-maxillary space (between the branches of the lower jaw), it may be found hotter than normal and the animal objects to pressure. A day or two later an enlargement of the lymphatic glands is found. It is painful and may interfere with swallowing, sometimes with the respiration. During this time there may be a discharge from both nostrils, at first watery, then it becomes thick and creamy. The pharyngeal lymphatic glands are sometimes affected, causing considerable dysphagia (difficulty in swallowing) food and water being returned by the nostrils. There may be dyspnoea (difficulty in breathing) producing a roaring, and, may be, apyxia (suffocation). There is always a considerable loss of condition. Several days after the first symptoms are noticed, the swollen glands fluctuate on pressure, and, if not lanced, will burst, liberating a thick creamy pus, occasionally streaked with blood, sometimes containing pieces of necrotic tissue and there may be more than one orifice. After the bursting the temperature subsides, but throughout the course of the disease exacerbations (rise) and remission (fall) are characteristic. Complications which may arise are pharyngitis, or the abscess may burst inwards into the mouth or pharynx,

giving rise to gangrenous pneumonia owing to some of the discharge getting down the trachea. The discharge may extend up the eustachian tubes, causing nasal gleet. If strangles affects another part of the body without jaw lesions, it is spoken of as Bastard Strangles, which is a much more serious affair.

Treatment.—The treatment of an ordinary case of Strangles is usually simple, and the mortality is small. The lines of treatment to be followed are isolation, good hygiene, warmth, and plenty of fresh air. Put the animal in an airy loose box with plenty of bedding, put on rugs and stable bandages; leave door open at daytime so that the animal can get his nose into the open air if it wants to. Plenty of clean fresh air is most important. Feeding:—Hot bran mash and green stuff tempt the invalid, but too much grain should not be given. Feed a little at a time but often. It is always as well, where possible, to feed from an iron manger, as it is easily kept clean and sterile. The affected glands should be poulticed to bring to a point. Personally, I prefer a fairly smart stimulating liniment well rubbed in three times a day, or you can apply a mild cantharides blister in the very early stages. Internally, give mild febrifuges. Best are, a combination of potassium iodide, magnesium sulphate and potassium nitrate in powders. Always avoid drenches or balls. When the abscess is mature it should be lanced, but do not lance too soon. This is a most important point, as there is danger of puncturing important vessels in that vicinity: also you run the risk of secondary abscess formation. I am often able to open an abscess when properly pointed and fluctuating with nothing more than the index finger. The wound when evacuated should be kept open with a plug of antiseptic gauze or tow as long as there is any discharge. Irrigate the wound three times a day with a syringe and disinfectant. Tincture of Iodine solution is very good.

When pharyngitis is present, it is best treated with inhalations of steam, medicated with oil of turpentine and oil of eucalyptus, and a stimulating liniment should be applied to the throat. This is preferable to fomentations or poultices. An electuary containing belladonna, potassium chlorate, honey and glycerine, should be given three times a day, placing it on the back of the tongue between the molar teeth. This relieves the difficulty in swallowing and allays

irritability of the larynx. If the difficulty in breathing is excessive and distressing, tracheotomy should be performed.

The patient's appetite should be tempted with food of all kinds, as if he refuses food there is great danger and difficulty in forcing food on him. In fact, the administration of drenches or food is impossible in many cases, in consequence of the presence of laryngitis.

The animal must not be put to work until completely recovered and picking up in condition.

Febrifuge Mixture for the primary stage of Strangles.

Potassii Iod.	... 2 ounces
Magnessii Sulph.	... 12 ounces
Potassii Nit.	... 2 ounces


Mix and divide into six powders.

Give one twice a day in the drinking water.

Electuary for cases of Strangles complicated with Laryngitis.

Ext. Belladonnæ	... 1 ounce
Potassii Chlorat	... 2 ounces
Ac. Borici	... 1 ounce
Glycerine	... 2 ounces
Honey	... 2 ounces

Give two tablespoonfuls on the back of the tongue
three or four times a day.



The Practical Value of Soil Analysis.

By G. N. Blackshaw, B.Sc., F.C.S.

The amount of information which can be obtained from the analysis of the soil is inclined to be over estimated, especially is it so in this country where a systematic soil survey, for the purpose of arranging the soils according to type and noting the crops most suitable for each, has not yet been instituted. Many farmers have the impression that the analyst, merely from the examination of a soil in the laboratory, will be able to issue a report containing information as to the crops most suitable therefor, what fertilisers if any are required, and *a priori* the best manurial dressing, etc.

Although our knowledge of Rhodesian soils and their peculiarities has gradually become more profound there are still vast tracts of country of which comparatively little is known: even in the settled areas it will be generally admitted that many more years of careful trial and observation are necessary before we can arrive at a correct measure of the potentialities of our soils. A considerable amount of attention has been devoted to the investigation of cultivated soils with the object of increasing the amount of information of practical value deducible from a soil analysis, which can not be obtained by an examination of the soil, subsoil, etc., on the spot; and whilst on the one hand it cannot be said that the investigators have so far met with the degree of success they deserve, yet on the other it would be quite misleading to infer that no information of practical value had accrued from their work.

In Rhodesia we have so far made very little use of manures or fertilisers; on many of our light tobacco soils, however, the application of manures or fertilisers is absolutely essential, so that it behoves us to find what is the best manurial dressing. To follow the example set in older countries, we shall proceed to acquire the necessary information not by soil analysis but by manurial experiment on the land, that is by trying all possible combinations of fertilisers and noticing which produces the most profitable return; if soil analysis were able to settle the question satisfactorily, obviously there would be no necessity for extended and laborious field trials.

To those who have not made a careful study of plant nutrition it may appear somewhat odd that the analyst, after finding the amount of plant food constituents present in the soil, is unable to deduce with certainty the best manurial dressing which will supply apparent deficiencies; an example, however, will clearly show the difficulty with which he is beset. The three constituents of plant food, in one or more of which the soil is most liable to be lacking, are nitrogen, phosphoric oxide and potash: a fourth may be added, namely, lime, which produces an improvement when added to soils, particularly heavy ones, deficient in that constituent. The example selected is an experiment on the manuring of oat hay conducted at the Elsenburg Agricultural College, Cape Colony; the sandy soil used for this trial was analysed by the writer before the application of the fertilisers. In the following table is shown the amount of nitrogen, phosphoric oxide, and potash, per acre in the top twelve inches of the soil, and the amounts of these constituents of plant food taken therefrom by an average crop of oat-hay grown on such soil at the Cape.

Nitrogen, in soil 1,650 lbs.; removed in crop 20 lbs.

Phosphoric oxide, in soil 2,310 lbs.; removed in crop 8 lbs.

Potash, in soil 2,970 lbs.; removed in crop 20 lbs.

It will be seen that there was sufficient nitrogen, phosphoric oxide and potash in the surface soil to supply 82,288, and 148 crops of oat-hay respectively; nevertheless the application of fertilisers containing the above constituents

greatly influenced the yield per acre, as the following results of manurial treatment will show:—

Plot	Manurial treatment per acre	Yield of Oat Hay per acre	Increase
1.	Unmanured	1239 lbs	...
2.	75 lbs. of Nitrate of Soda (containing 11.7 lbs Nitrogen) ...	1734 lbs	495
3.	200 lbs of Superphosphate (containing 32 lbs. of Phosphoric Oxide)	1461 lbs	222
4.	40 lbs of Sulphate of Potash (containing 20 lbs Potash) ...	1656 lbs	417
5.	75 lbs Nitrate of Soda, 200 lbs Superphosphate, 40 lbs Sulphate of Potash ...	2988 lbs	1749
6.	200 lbs Superphosphate, 40 lbs Sulphate of Potash ...	1641 lbs	402
7.	75 lbs Nitrate of Soda, 40 lbs Sulphate of Potash ...	2490 lbs	1251
8.	75 lbs Nitrate of Soda, 200 lbs Superphosphate ...	2280 lbs	1041

As all food is absorbed in solution by plants, material which will not dissolve in water or in the sap exuded from the root hairs of plants, is not taken up, in other words it exists in dormant or unavailable forms. The increased returns on the manured plots show that the bulk of the nitrogen, phosphoric oxide and potash in the soil is present in one or other of these unavailable forms; otherwise there would obviously be such an excess of available plant food already in the soil that no increase would result from the application of available food in the form of manures. These dormant or unavailable forms of plant food are gradually changed to available forms by the ordinary weathering agents which disintegrated the original rock from which the soil was formed, by the acid products resulting from the decomposition of vegetable matter, and by the application of lime, etc., but these changes are so slowly brought about that in most cases the application of manures, as is seen in the above experiment, produces a marked increase in crop.

To determine the total quantity of plant food in a soil and thereby obtain a measure of its permanent fertility is comparatively simple: but to distinguish satisfactorily between

the available and unavailable forms of plant food, and so determine the best manurial dressing to supply deficiencies in soluble food constituents, is the difficulty which the soil analyst has to face.


Various methods of estimating the *available* phosphoric oxide and potash in soils have been tried, usually by the extraction of soil with very weak acid solvents, of which perhaps the most common is a one per cent. solution of citric acid. Although the amount of phosphoric oxide and potash dissolved by a citric acid solution of the strength mentioned is influenced by several factors besides the solubility of the forms in which these constituents are present in the soil, yet to a certain extent it affords a clue for determining by a laboratory examination the need for phosphatic and potassic manures. Thus the chemical analysis of a soil, which possesses no abnormal characteristics such as marked infertility, supplies information regarding the total amount of plant food present therein, or in other words its inherent fertility; but until we have got our soil types properly fixed, which can only be done satisfactorily after a geological survey has been made, the deductions which can be drawn from the analysis of a soil, regarding its suitability for particular crops, its immediate fertility, and the manurial treatment where the use of manure is a necessity, have their limitations.

The analysis of soils which are very infertile often affords valuable information and may perhaps be the means of suggesting a method by which the cause of the infertility may be wholly or partially removed. Many such cases await investigation and will be dealt with as soon as possible.

In this country the value of a soil survey must be very patent, there are still immense areas of virgin country to be opened up, and of their potentialities we know very little. A systematic survey of our soils, classified according to geological origin, will enable us to arrive at the general characteristics of each particular class or type, and once the value of representative soils of the various types has been satisfactorily determined by practical tests, the information supplied by the analysis of virgin or practically virgin soils will be very materially enhanced. The soil survey should if possible follow a geological survey, and in this connection it is pleasing to note that the Administration is about to in-

stitute a systematic geological survey of Southern Rhodesia for with geological features known, we shall be able to group our soils according to the formations from which they are produced, a basis of classification which is clearly the most satisfactory.

The execution of a soil survey will involve the spending of a little money, all the same the information gained will repay manyfold the outlay which is necessitated. With the suitability of certain soils for particular purposes determined by experience, we can conclude that virgin veld which analysis has proved to belong to the same type, can most probably be put to the same uses, given similar climatic conditions. The soil survey of a young country is on quite a different plane to that of one long settled: in a new country it is in the nature of an exploration with the object of finding, by comparison with known soils, the uses to which virgin tracts may be put: in an old country, where the soils have long been worked and are known by practice, the practical value of a soil survey is perhaps less obvious. Again the composition, both mechanical and chemical, of soils in their virginity, is certainly the most reliable basis of comparison, since their characteristics can be materially changed by cultivation and treatment; bearing these facts in mind it is quite evident that the present is the most opportune time for the institution of a systematic soil survey of the country.



Epizootic Abortion in Cattle.

By LL. E. W. BEVAN, M.R.C.V.S.

Although there are a number of circumstances which will cause animals to cast their young before the full period of gestation, it should be borne in mind that there is a form of abortion in cattle, and possibly in other species, which is contagious: this particular form being caused by a microbe present in the aborting animal, its discharges and the aborted materials, is easily disseminated, and, when once established, is with difficulty eradicated.

The financial losses caused by this disease in other countries have been so appalling, that some years ago the Veterinary Department of Rhodesia thought it wise to include Epizootic Abortion in the list of diseases subject to the provisions of the Animals Diseases Consolidation Ordinance of 1904.

In dealing with this disease much depends upon the individual, for it is essential that the first cases shall be detected and dealt with. It is with the object of helping the stockowner to recognise the disease at its onset that the following notes are published.

I.—HOW TO DETECT THE DISEASE.

(a) *By the circumstances of the outbreak.*

By the fact that a number of cows abort in succession ;
that a tendency to abort persists ;

that the average period of pregnancy at which abortion takes place is from five to seven months ;

that other causes of abortion, *e.g.*, injuries, febrile diseases, atmospheric influences, faulty food or water, poisons, etc., may be excluded ;

possibly, by the circumstance that abortions have only occurred since the introduction of certain cows to the herd.

(b) *By the symptoms.*

The abortion generally takes place without effort or inconvenience.

There may be no premonitory symptoms, or there may be noticed some uneasiness on the part of the cow; she may "make a bag" rather suddenly, her vulva may be swollen and a blood-stained mucous or a yellowish discharge may come from it.

Frequently the membranes are retained and are then unusually difficult to remove by hand. Their retention gives rise to the usual complications.

After the abortion, a thin yellowish discharge may continue to come from the genital organs for several weeks. Subsequently oestrus may be unduly frequent, but the cow may not become pregnant, or may abort again, sometimes as often as three times in a year.

(c) *By the aborted materials.*

The foetus is generally dead, but it may be alive, in which case it is weakly and soon dies. It may be mummified but it is rarely putrid. Its umbilical cord may be dropsical.

The foetal envelopes may look macerated, the outer membrane having a thickened or leathery appearance. This may be covered with an exudate of a light brownish-yellow colour, and sometimes of a chocolate colour, varying in consistency from that of a fluid pus to that of a tough dough. This exude is particularly abundant around the "cotyledons" or vascular tufts which are studded over the outer envelope and which graft the foetus to the mother.

In advanced cases these tufts may be softer than normal and even pulpy; they may have a distinctly yellow, necrotic appearance.

(d) *By recognition of the specific causal microbe.*

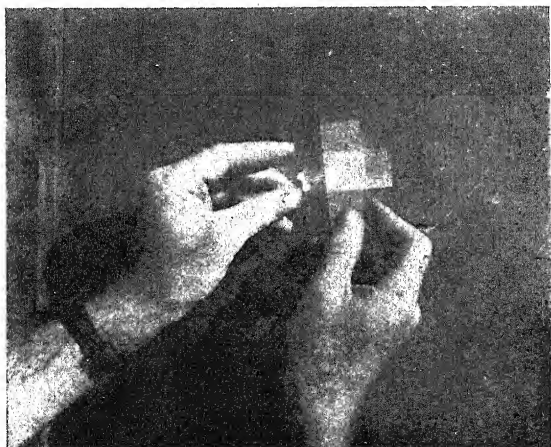
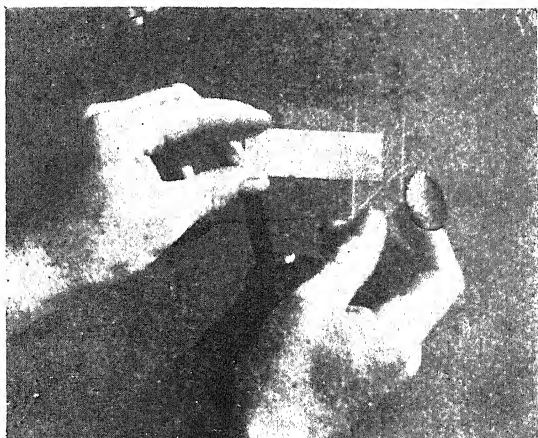
(See paragraph 2 and 6e.)

2.—THE CAUSE OF THE DISEASE.

- (a) The disease is caused by a bacillus which is present in the uterine exudate of an affected cow, in the discharge which comes from the genital organs after abortion, in the stomach fluid of the foetus, and in the foetal envelopes.
- (b) This microbe can be recognised when preparations from the above virulent materials are properly stained and examined under a powerful microscope. It can also be cultivated on suitable media and under certain conditions in the laboratory, growing in a characteristic fashion. (See illustration).
- (c) The bacillus may retain its virulence for about seven months if kept in fluid material and free from putrefaction. Desiccation has a destructive influence on the vitality of the virus.
- (d) It is thought that the microbe does not propagate outside the animal body under natural conditions, and it is highly improbable that abortion bacilli remain for a long time active in the bodies of non-pregnant animals or persist long in the womb of a cow which has aborted; in some cases they cannot be found a month after abortion.

3.—HOW THE DISEASE IS SPREAD.

- (a) By affected in-calf cows introduced to a clean herd.
- (b) By a bull which has served an affected cow.
- (c) By cows which have aborted.
- (d) By the dissemination of the microbe in the virulent materials, *i.e.*, the exudate or discharge from an aborting cow, the aborted foetus and its envelopes. This material may be transported in soiled manure; on the bodies of the aborting animals and their companions; on the hands,



Epizootic Abortion.

clothing and boots of attendants; by dogs, jackals and vermin. Food and water may be contaminated thereby.

4.—HOW THE DISEASE PERSISTS.

- (a) In pregnant infected cows.
- (b) In cows that have aborted, for a short time after the act.
- (c) Possibly in the bull, and in animals other than cattle.
- (d) In contaminated pastures, shelters and buildings. (The bacillus being easily destroyed by desiccation, it is probable that the infection remains longer in moist and shaded places).
- (e) In practice, it is found that when no fresh infected cattle are introduced to an infected herd, the disease tends to die out. This is attributed to the fact that a certain degree of immunity is acquired as the result of an attack.

5.—HOW TO ERADICATE THE DISEASE.

- (a) By detecting the first cases and notifying them to the Veterinary Department. (Paragraph 1 and 6.)
- (b) By isolating animals shewing premonitory symptoms (Paragraph 1b).
- (c) By segregating animals which have aborted. (Paragraph 3c).
- (d) By the careful destruction of all virulent materials (Paragraph 2) and everything contaminated by them (Paragraph 3d) preferably by burning, and, if possible, on the spot.
- (e) By disinfection of the contaminated buildings, shelters, kraals, etc., with a reliable disinfectant, *e.g.*, corrosive sublimate 1 part in 2,000 of water, carbolic acid 3% watery solution, Jeyes' Fluid, Izal, MacDougal's Dip, etc.

- (f) By avoiding infected pastures and especially moist places likely to have been contaminated. (Paragraph 2c).
- (g) By disinfection of the herd by careful spraying and dipping. (Paragraph 3a.b.c.)
- (h) By irrigating the genital passages after abortion with 2% solution of carbolic acid in tepid water, daily until the discharge ceases.
- (i) By keeping a special bull for the "service" of cows which have aborted. (Paragraph 3b).
- (j) By preventing the re-introduction of the disease with new arrivals.
- (k) For the purpose of dealing with this and other diseases, a portion of the farm should always be kept free from cattle, and, if necessary, a hay-stack should be available to supplement natural grazing. (See Bulletin No. 4 on African Coast Fever).

6.—HOW TO NOTIFY AN OUTBREAK TO THE VETERINARY DEPARTMENT.

- (a) The owner who has reason to believe that the disease exists upon his farm should report his suspicion to the nearest official of the Veterinary Department, or write direct to the Chief Veterinary Surgeon, Salisbury.
- (b) He should state the species of animals affected, the number and dates of abortions, and, if possible, the dates of "service" of the animals which have aborted.
- (c) He should describe as accurately as possible the circumstances of the outbreak, the symptoms noted, the condition of the foetus and membranes, the character of exudates and discharges.
- (d) He should record recent arrivals of stock on his farm.

(e) He should obtain from the Veterinary Department the following materials and make preparations as described, to assist in the diagnosis of the disease by laboratory methods.

(1) GLASSES.—On these should be collected and spread in a very thin film, as in the illustration :

(a) a drop of discharge from the aborted cow ;

(b) material scraped from the tufts on the after-birth ;

(c) material from the stomach of the foetus.


(2) TAMPON TUBES.—Having removed the cotton-wool plug, the tampon of wool attached to the copper wire should be withdrawn and moistened with exudate, discharge, afterbirth, or contents of the stomach of the foetus.

Care should be taken to avoid touching anything except the suspected virulent materials.

The tampon should be replaced in the tube and the cotton-wool plug should be re-inserted.

(3) BOTTLES.—Small pieces of suspected virulent material may be sent in these for examination.

The preparations should be carefully packed and sent at once to The Chief Veterinary Surgeon, Salisbury.



Regulations Affecting the Importation of Potatoes.

By RUPERT W. JACK, F.E.S., Government Entomologist.

During the coming season, potatoes imported into Southern Rhodesia will be subject to certain special regulations, the object of which is to prevent the introduction into our borders of the destructive disease known as "Black scab," and further to ensure that the farmer obtains a supply of seed potatoes as free from infective diseases and pests as possible. The Regulations are detailed under Government Notice No. 309 of 1909, and came into operation on March 1st, 1910, that is to say, after the last planting season. The incidence of the regulations will thus be felt for the first time when the importation of seed potatoes from overseas recommences to supply the farmer with material for this season's crop.

The regulations are as follows :—

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910 :—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

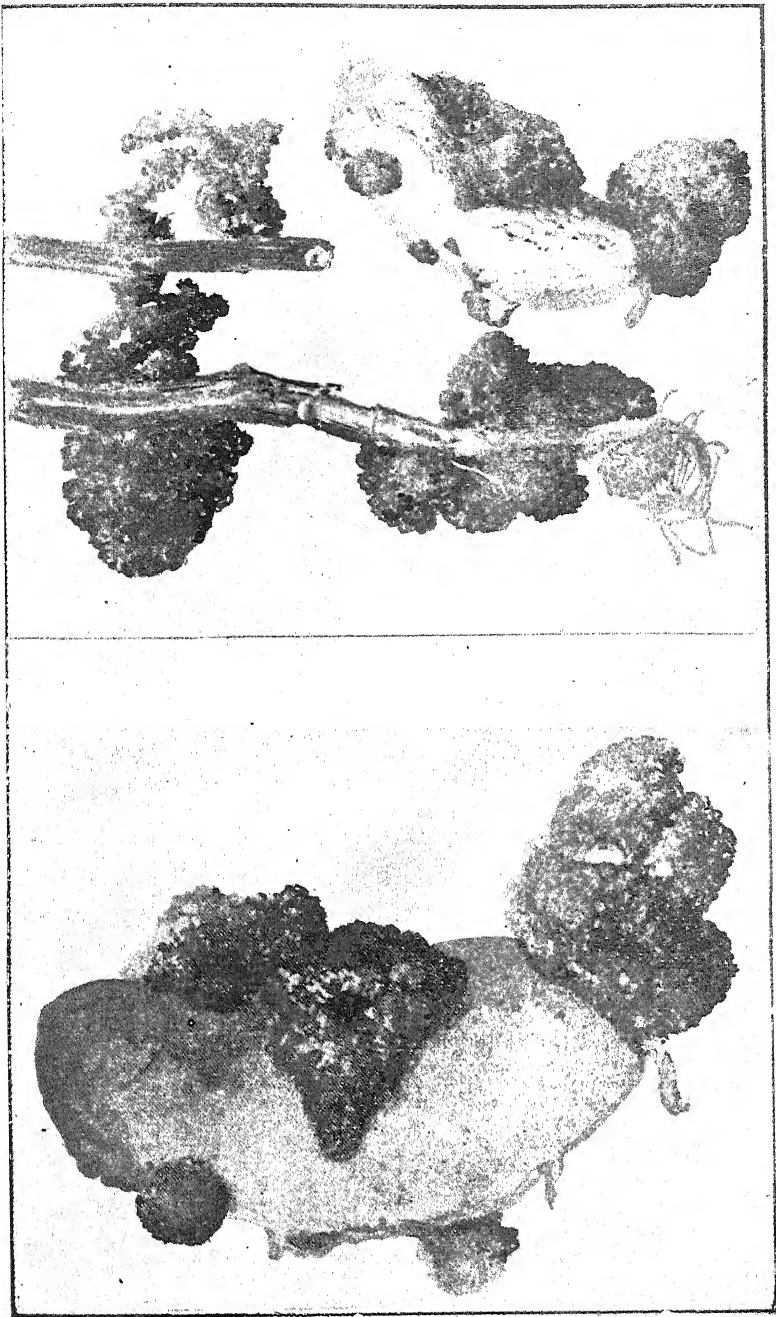
(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

Warty Disease or Black Scab (*Chrysophlyctis endobiotica*) occurs in the British Isles and on the Continent of Europe. It is thus described in Leaflet No. 105 of the British Board of Agriculture and Fisheries :— "Wart Disease, Cauliflower Disease, Canker, Fungus, or Black Scab, attacks the tubers



Black Scab or Wart Disease of Potatoes (*Chrysophyctis endobiotica*).

From British Board of Agriculture and Fisheries Leaflet No. 105.

and haulms of potatoes, giving rise to large and irregular outgrowths which resemble pieces of cauliflower covered with mud. Warts or wrinkles appear at first near the eyes of the young tuber, and later several warts, by growing together, form a brown spongy scab, which finally becomes black." (See plates I and 2). The disease is reported to have caused severe loss in many parts of Great Britain, ruining the crops and infecting the soil for several years after it has obtained a hold. The same leaflet contains the two following statements:—"Although in the first instance only a few plants may show the Wart disease, it is almost sure to spread more or less rapidly, and the disease must be treated as a dangerous enemy, which, if neglected, may entirely prevent the growth of potatoes where it occurs"; and further on:—"When disease appears it may, if neglected, spread over a farm and render the soil useless for potato growing in the course of a few years." This destructive disease has not yet been identified in South Africa, and it is felt that the Government will have the entire support of the farming community in enforcing stringent regulations to prevent its introduction. The value of the certificate required under Section I of the Government Notice is enhanced by the fact that under the British Destructive Insects and Pests Act, 1877-1907, the occupier of land that becomes infected with the disease is required to report the outbreak at once to the British Board of Agriculture and Fisheries in London. A grower is thus not likely to have the disease on his land unknown to himself, and the temptation to fill in a false certificate is lessened.

Amongst the diseases which will be considered, to call for the sorting of a consignment of imported tubers may be mentioned: Corky Scab (*Spongospora scabies*), Potato Scab (*Oospora scabies*), Potato Bright (*Phytophthora infestans*), Potato Bacteriosis (*Bacillus solanacearum*). The two chief pests will be Potato Tuber Moth (*Gelechia operculella*) and Root Gall Worm (*Hederodera radicolola*).

An illustration of Corky Scab (*Spongospora scabies*) was published in the *Agricultural Journal* for April, 1910, and the disease is discussed in the same issue under Notes from the Agricultural Laboratories. It may be mentioned that up to

the present time no instance of the disease having occurred in Rhodesian potatoes has come to the notice of the Department.

Potato Scab (*Oospora scabies*) is a well-known and very widely spread trouble (see Plate 3). It first appears in the form of superficial scabby spots on the potato. Under favourable conditions these spots may enlarge and run together to form irregular rough patches, sometimes enveloping nearly the whole of the tuber's surface. These spots do not extend into the tissue beneath, and the eating qualities of the tuber are scarcely impaired. The market value of the crop, however, suffers considerably. This disease is spread by the planting of infected sets, and once the soil has become contaminated it will go on producing scabby tubers year after year. The land needs to be planted for several years with some other crop not subject to the disease in order to rid it of the infection. In the light of these facts, it is felt that, although Potato Scab is quite common in Southern Rhodesia, an effort to ensure that the seed supplied to the farmers is free from infection will be for the good of the country as a whole. It may be mentioned in connection with this disease, that soaking the seed in a solution of Formaline, at a strength of one part to thirty parts of water, for one and a half hours, is reported to be effective in destroying the spores of the disease, and that scabby potatoes treated in this way will produce a clean crop if planted in clean land.

Potato Blight (*Phytophthora infestans*) is the disease which did such terrible damage to the potato crops in Europe in the years 1845-1850, and caused such severe want amongst the poorer peasants. The disease is by no means the same scourge at the present time as it was during the five to ten years which followed its invasion of Europe. It flourishes, however, under conditions combining warmth and moisture, and we have it on the authority of Mr. Pole-Evans, of the Transvaal Department of Agriculture, that the disease occurs in Cape Colony. Potato disease attacks the leaves, stems and tubers of the plant. The infection in the tuber is visible in the form of brown spots on the surface. If a section be made through one of these, the discolouration is seen to extend into the tissue beneath. It forms brown patches on

the leaves and stems, and under suitable conditions spreads with extreme rapidity, quickly blighting the whole crop. Diseased tubers, if used for seed purposes, will, under favourable conditions, infect the ensuing crop.

Potato Bacteriosis (*Bacillus solanacearum*) belongs to a different class of diseases. The cause is not a fungus but a bacterium, a lower form of vegetable life. This disease occurs in Europe and the British Isles, and has caused considerable loss. It invades the leaves, stems and, finally, the tubers. In the tuber it forms a discoloured layer which is visible on section as a brownish ring parallel with and a little distant from the surface. The tuber finally dries up, the tissue crumbling away into powder. When this occurs in a tuber in the soil, myriads of the bacteria are released to infect a later crop.

An illustrated article on the Potato Tuber Moth (*Gelechia operculella*) appeared in the *Agricultural Journal* for February, 1910, and it is not necessary to repeat the details here. To plant tubers infested with this pest is to endanger the resulting crop, and, although the moth is only too common within our borders, that is no reason why the importation of "wormy" tubers should be permitted to set up new centres of infestation. It is not only the "sets" planted that constitute a source of infestation; the moths breeding out from the sacks of infested tubers are capable of flying to the lands and there laying eggs which result in infested plants. The fact of this pest being an enemy of tobacco emphasizes the value of precautionary measures. Potatoes offered for introduction into our borders infested with this pest originate almost entirely from other parts of South Africa.

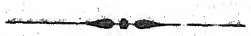
The Root Gall Worm (*Hederodera radicola*) is the subject of discussion under Notes from the Agricultural Laboratories for August, 1910, and an illustration of a tuber shewing the characteristic galls, and others in process of subsequent destruction by Dry Rot, is furnished. This pest is very liable to be introduced from other parts of South Africa and also from overseas. It is most desirable that steps should be taken to check its being spread through the agency of imported seed to new farms, as it is capable of flourishing exceedingly

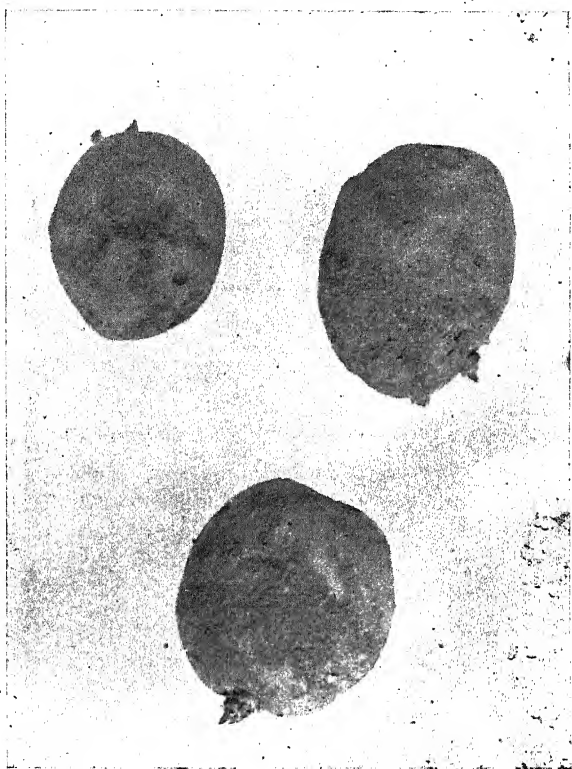
under certain conditions in these territories, and frequently throws land out of use for growing potatoes for several years.

It is hoped that these brief notes will explain in some measure the necessity of special regulations to control the importation of seed potatoes into Southern Rhodesia. Unfortunately it is not practicable to distinguish between potatoes imported for seed and those to be used for culinary purposes, so that the regulations must apply to all. Luckily the number of consignments of eating potatoes introduced is very small indeed, as our farmers are, as a rule, well able to meet the demand in this respect.

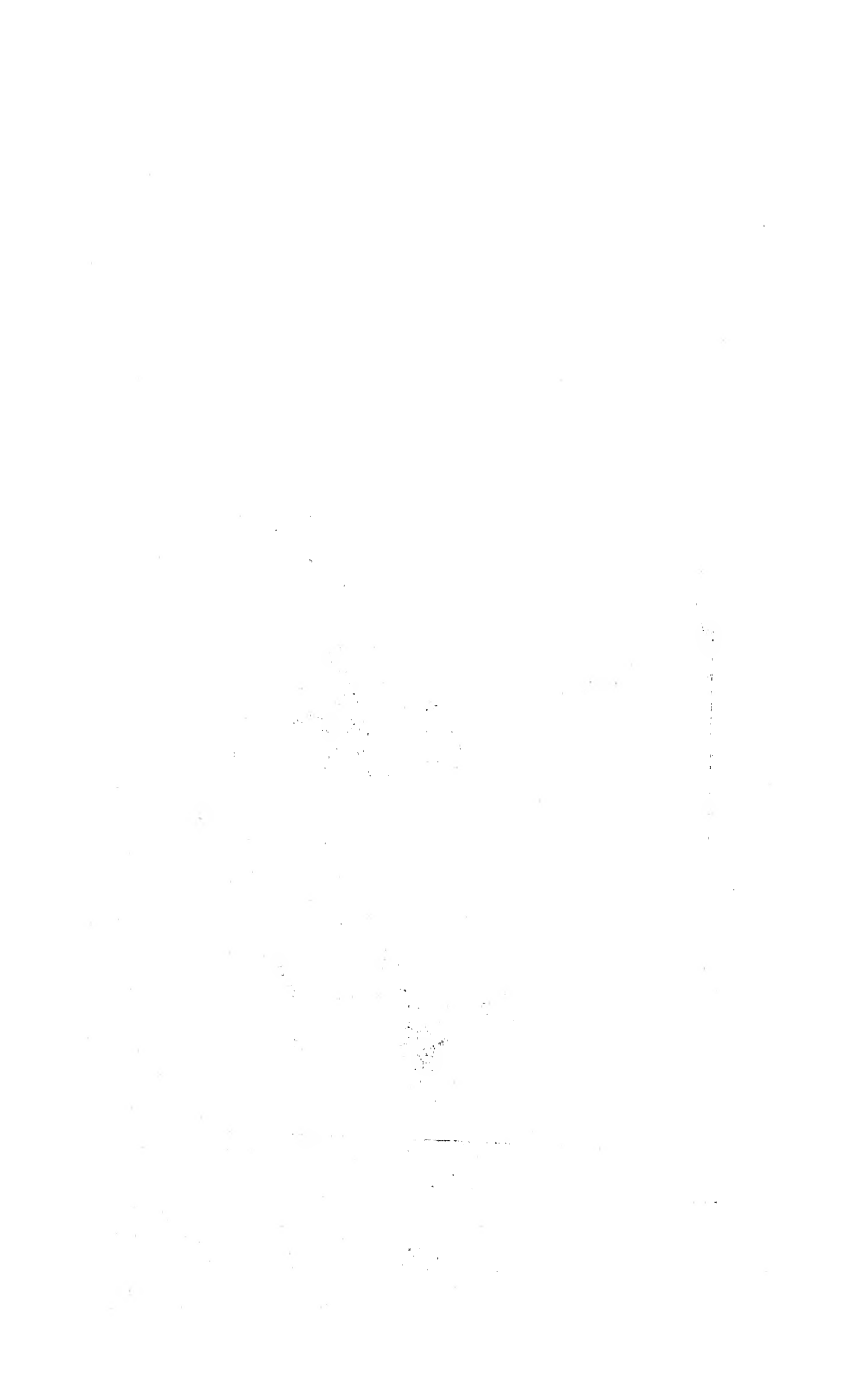
Seed potatoes stand in a class by themselves amongst plant imports in that, as has been pointed out, they are liable to carry various diseases and pests, which also attack the growing plant, and that they are intended for introduction directly into the soil, so that the perpetuation of the troubles is practically assured.

Timely warning of the enforcement of these regulations has been sent to all the known importers of seed potatoes, and it is hoped that this will have the effect of preventing losses of consignments owing to lack of the required certificate or from infestation of the tubers with pest or disease.





Potato Tubers, affected with Potato Scab (*Oospora scabies*).



Poultry.

By Philip L. Hall, Lenham Farm, Syringa.

EGG PRODUCTION.

Beyond any question, chickens and eggs can be produced profitably as one of the many branches of general farming, although it is not every farmer who makes them pay, but he could if he would. We have seen also that the amateur can make egg production profitable, as he uses the hen very largely as a convertor of wasted material into good food. The question therefore that remains, and about which many are in doubt, is whether a man can make egg production a business out of which he may get a living. The answer must be in the affirmative. Given the right man in the right place, suitable material and methods, a sufficiency of capital and experience, and egg farming may be made to support a man and his family. This is not mere hypothetical supposition—it is being done, and what is being done by some, it is reasonable to suppose, may be done by others. All the “ifs” and “buts” in the question converge on the man, therefore it cannot be done by every man. No man, whatever his self confidence, should commence upon too large a scale. The business that is the most permanently successful is the one that grows naturally. The man whose money is at stake must be the ‘head cook and bottle washer’ himself, and until he is absolute master of the whole of the details of his business, he must remain independent of hired labour other than a boy or two. When he knows what to do, and how to do it, he may extend operations which necessitate the employment of assistants. Most of the men who are now making a success of the business will agree that it took the first year’s losses to convince them that the management of egg producing hens is not a natural gift vouchsafed to all men, and that the second year’s work was devoted to making good the losses of the first. By the end of the second year they had made enough to make a real start. One of the most successful egg producers I have

known is a man who commenced with only between two or three dozen hens and devoted the whole of his first year's work to them before he commenced to extend.

The other classes of producers referred to, the farmers, small plot holders and amateurs, inasmuch as they do not in the first place select their holdings, cottages or villas with a view to the accommodation of fowls and the marketing of eggs, must make their poultry fit their surroundings. The man who intends to make the production and sale of eggs the main object of his enterprise must, on the other hand, find the right locality and surroundings to suit his hens. This is the initial difficulty and it is a considerable one. In the first place he wants to select a situation either within easy reach of his market or the railway, and although I do not think there would be any great difficulty in obtaining sufficient land for a large and profitable poultry farm by purchase or renting a portion of the present owners' farms along the railway, the difficulty of obtaining an adequate water supply, except at heavy cost is the main trouble.

There is a widespread impression that any land is good enough for fowls. An ideal site would be on a southern or south-westerly slope composed of a good loam and a sub-soil of gravel, sufficiently wooded (especially to the East) to give protection from wind in the winter. The ideal, however, being that which exists in idea, is very seldom realised in fact, so that the egg farmer has, as a rule, to put up with some disadvantage. He should avoid a site composed entirely of sand, owing to the lack of insect life of the right sort, and as clay or very heavy soil considerably restrict the possible breeds which will thrive upon it, they also should be avoided. Where there is loam upon gravel, almost any breed can be run with success. Even the ideal site if situated 20 miles from town or siding, would be unsuitable, a "sine qua non" being nearness to rail and market. The produce is perishable, rendering quick marketing essential.

Intimately connected with the choice of the holding, as affecting the necessary site, is the settlement of the question as to whether the fowls are to be at liberty or in runs.

For the production of eggs for marketable purposes, should the farming be extensive or intensive, I have no hesitation in plumping for the latter, although there are many who hold the opposite view, contending that no more than 120 fowls should be run to the acre. For breeding purposes freedom is perhaps preferable although even then the percentage of fertile eggs will probably be low, but the man who is going to get as many eggs for market out of his fowls as will make the business pay, will do better by keeping them in confinement. Further he cannot, as can the general farmer, afford an acre to every 120 hens. By confinement I do not mean to suggest overcrowding. The range of the fowls should be limited, so as to be under control. It is essential that the ground should carry as many head as possible consistent with the maintenance of its freshness, which is best done by the adoption of the system of alternate runs. By a well planned system from 400 to 500 may be kept to the acre.

It is above all things necessary in the laying out of such a farm that the constructions and arrangements shall all be made with a view to economising labour in attending to the birds. The chief drawback to the system is the considerable outlay at the commencement in specially constructed houses (and by no means least wire netting). On the other hand the keeping of fowls under control is the only satisfactory way to increase the egg yield. Fowls having full liberty undoubtedly find a quantity of food but do not produce so many eggs as those whose range is limited. Further it is necessary that such a business should be able to keep up a good supply of eggs all the year through; and fowls having their freedom cannot be kept sufficiently warm and comfortable during the winter nights. A thoroughly good arrangement of roost shelters and runs is essential upon an egg farm. The buildings must be so constructed and of such material, as will enable them to be kept well ventilated and cool in summer and yet snug and warm in winter. It is by no means necessary that the roost and shelter should be under one roof but it is much more economical to build them so, and the multiplication of buildings adds to the labour in feeding and cleaning. The suggested plan is that the roost and nest (or trap nest) should be at the back of the building which is divided from the front, and that

the front and larger portion be used as a scratching shed shelter from which the hens have access to the runs. Plenty of light must be allowed at back and front. The dividing partition of each pen must be furnished with a door so that the attendant can pass from end to end and do most of his work under cover. With some slight modifications I have seen a similar range of houses in use with most successful results as regards the health of the fowls, the high laying records and the production of the eggs at the time of greatest demand.


In dealing with such a large subject as egg production there are necessarily many side issues, which cannot satisfactorily be brought within the scope of a short series of articles. Such for example as specialisation in the production of fertile eggs for the supply of settings, the filling of incubators and so forth. I think, however, I have broadly covered the ground I mapped out at the commencement, which was to deal more particularly with the production of eggs for marketable purposes by various classes of producers, there remains therefore only the necessity to add a few concluding remarks relative to marketing. It is absolutely unprofitable to produce large quantities of eggs if they are marketed without care and without knowledge. It is not always just to grumble at the bad prices returned from the market. Before drawing invidious conclusions from such unfortunate results it is necessary to ask the producer a few plain questions. Were his eggs properly packed in clean packing? Were the eggs clean themselves? Were they graded according to size? and, finally, was the quality right? Granted that the producer has many just causes for complaint, is it not also true that the market master and the consumer are not always well treated by the producer? The faults are not always on one side.

The remarkable success obtained by our foreign competitors in our markets has of course been aided by a combination of favourable circumstances which cannot be adequately dealt with now. One fact however which immediately concerns us is that, having reached our markets their eggs put side by side with those locally produced have won their way very largely to their appearance and reliability. It is useless to reiterate the undoubted fact that we can pro-

duce better eggs than those we import in face of the well known influence which appearance has upon prices realised in markets. This is true of eggs and poultry in many cases and many other articles of produce. Our competitors were the first to grasp the importance of appearance and have thereby benefited at our expense.

We are learning slowly but still learning. We are gradually but surely beginning to understand that eggs of all sizes, shapes and colours (with of course the largest and best on top) packed carelessly in dirty and possibly damp hay cannot be expected to hold their own against those which are carefully selected, graded and well packed. If egg producers would only take a leaf out of the foreigner's book and grade their eggs the buyers in the market would know exactly what they were buying and would pay accordingly, and in the long run both consumer and producer would benefit. Foreign eggs are graded in three: firsts, seconds and thirds, and so perfectly sure can any buyer be that he has no hesitation in buying from the label.

This is the system that should be adopted by local producers otherwise it is impossible to blame the buyer who looking at a box of eggs of all sizes pays the value of the smallest and so obtains a percentage of large ones cheap.



Notes on Winter Pasture Plants and Grasses.

By. H. GODFREY MUNDY, Agriculturist and Botanist.

The laying down of artificial pastures, that is, pastures composed of exotic as opposed to indigenous grass, has made but slow progress throughout South Africa, nor is this to be wondered at when one considers the difficulty of finding any grass that will fulfil all the conditions required of it.

In discussing the subject, we can dismiss the question of summer grasses. During the summer months there is abundance and to spare of good nutritious grass suitable for grazing, and more or less also for hay, but what we have not got is a native grass which will remain green throughout the six months or so of the dry season. To discover such a grass has been, and yet remains, one of the most important aims of plant introduction in South Africa.

The conditions required of a winter pasture grass are: (1) great resistance to frost and drought; (2), longevity or permanency as a pasture; (3), ability to hold its own against veld grasses and weeds; and (4), nutritious feed for stock.

Many farmers look for a grass which will last for ever, the seed of which can be cast on the unbroken veld—expecting it in a short space to become established and overcome the native grasses, and which will provide good grazing throughout the year. It may at once be said that these conditions are too drastic, and to establish a good pasture in as short a space of time as possible preparatory ploughing and cultivation of the land is just as essential as for any other crop.

Given a suitable grass, one of the main difficulties of establishing a pasture is the need of fencing. If unprotected during the early stages of growth, the plants are damaged by game or too heavily stocked by cattle, with the result that they are unable to cover the ground and so protect their roots from the scorching sun or wind,

Many of the vleis soils of this territory produce hard wirey grass which, except during the first few weeks of spring growth, are practically worthless for grazing. The point which must be considered is whether such vleis cannot be converted into valuable perennial winter pastures by the introduction of some of the hardier exotic grasses.

In order to test what winter grasses, if any, could be grown in Southern Rhodesia, a number of plots were laid down on the Experiment Station last year, and some account of these may assist farmers to determine whether it is not worth their while to experiment with the grass seeds offered by this Department. The kinds chosen in the first instance were those known to have given promising results in Natal, the Transvaal and Cape Colony, and were it not for this fact, it would be impossible to draw any accurate conclusion, from experiments extending over one season only.

PASPALUM.—(*Paspalum dilatatum*). This grass had already been tested on the old Experiment Station, Salisbury, and by individual farmers such as Mr. McLaurin on Pomona, and good results were expected from it. At the beginning of January, a number of old roots were broken up and the slips obtained were planted in ploughed ground in drills $2\frac{1}{2} \times 1\frac{1}{2}$ feet apart. A week later, seed was sown broadcast over the plot at the rate of 3lbs per acre, or about one-fifth of the normal sowing when establishing by means of seed only. At this distance of planting about 10,000 slips per acre are required, and in spite of a three weeks' drought after planting, not more than ten out of the 2,500 slips planted on the $\frac{1}{4}$ -acre plot failed to grow. The seed used was of the highest quality obtainable, and this also grew freely, so that a thick close stand is expected next season.

The objection to planting slips in rows in this manner, is the time required before the latter become filled in with young plants, and the fact that meantime the stems and leaves tend to spread outwards, thus exposing the crowns, instead of growing upward and making a growth suitable for cutting. By sowing seed thinly the first year, in conjunction with the planting of slips, it is hoped to overcome this difficulty.

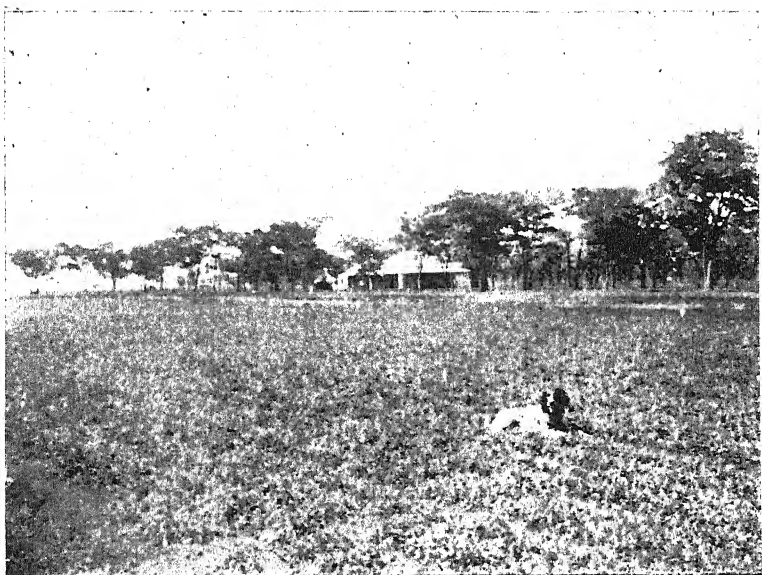
From first to last the grass has grown freely, and throughout June, July and August, always carried a fair amount of

green growth, suitable for light grazing. At the time of writing (in September) it is starting to make a strong spring growth, and would afford good grazing this month. The soil is a red loam and very hard and dry, while the winter has been a mild one and only light frosts have been registered.

There is little doubt that in damp soils *Paspalum* will grow even more strongly, but on the other hand, in cold low-lying situations, the effect of frost will probably be more severe. This grass is deserving of extended trial on sandy soil where frost will be light, and where, at a foot or two below the surface, moisture will always be found.

Those who have had experience of *Paspalum* will not hesitate to recommend it to others who are anxious to improve the quality of their grazing, since even in cold situations where mid-winter frosts may temporarily cut it down, the late autumn and early spring feed which it provides will be found invaluable. The grass is absolutely permanent, re-seeding itself freely and entirely gaining the mastery of native grasses and weeds.

TOOWOMBA CANARY GRASS (*Phalaris bulbosa*).— This is another grass which has reached South Africa from Australia with a big reputation for frost and drought resistance, and which has further been well reported on from the Cape Colony. The quarter-acre plot of Toowomba Canary Grass was situated next to that of *Paspalum*, and was established in a similar manner, namely, by transplanting in January, young plants raised in the seed bed during the spring. A good stand was established, and up to the end of May the grass retained a healthy green appearance. From that date, however, it began to wither and turn brown, so that on the 1st September hardly a green blade was to be seen on the plot, and whereas *Paspalum* has grown freely again after being grazed in July, Toowomba grass has remained practically at a standstill. These results are somewhat contrary to what was expected, judging by reports from elsewhere, and the reason may be that the grass had not taken as good a hold as it appeared to have done. Further observations next season may show better results, and in any case, the grass must be tested under a variety of conditions before being either condemned or recommended too strongly. It may possibly prove a better frost resister than *Paspalum*, and so



Sheep's Burnet (*Sanguisorba minor*) in mid-winter.

replace the latter in vlei soils where it can obtain more moisture; or possibly it may be hardier the second year, though this is not a general experience with grasses.

SHEEP'S BURNET (*Sanguisorba minor*).—Probably no hardier plant than this has ever been introduced into this country. It is a rapid grower, perennial up to three or four years or more, and almost entirely resistant to frost and drought. Sheep's burnet is a plant common on the close short pastures of the chalk downs of the south of England. The leaf growth does not reach more than six to eight inches in height, and it is therefore unsuitable for cutting for hay.

A half-acre plot was sown on the 26th December in drills 12 inches apart, 20 lbs. of seed being used per acre. Germination was strong, and the plants at no time suffered from drought. Owing to rawness of soil, growth was slower than usual, but up to the time of writing the stand has remained quite green and would have afforded good grazing for sheep or calves. The illustration opposite shows the pasture at the beginning of August.


To those farmers who are keeping sheep in conjunction with maize growing, a trial of Sheep's burnet should commend itself. The seed might be sown between the rows of maize at the time of the last cultivation and after the crop was harvested, and provided the burnet grew well, a good bite of green food would be available for sheep during the winter. During the summer months the crop could be grazed sparingly, and in the following winter it might be stocked heavily, fed to the ground, and the stubble ploughed under. Treated in this manner, a rotation of crops would be obtained, the land would be rested, and would further derive direct benefit from the droppings of the animals grazing upon it.

COCKSFOOT (*Dactylis glomerata*).—Experiments with this grass in the Transvaal appeared to indicate that it was only suitable for sowing on damp soil. On the Experiment Station here, however, it has done exceedingly well, and has continued quite green up to the middle of September. Owing to rawness of soil, growth has been slow, but if one may form an opinion from the results of one season only, it seems likely that under moister conditions on vlei soils, Cocksfoot

would do extremely well, and being a good frost resister may perhaps provide green feed in mid-winter, when *Paspalum* is more or less dormant.

TALL FESCUE (*Festuca elatior*).—This grass was also tested as a comparative trial against cocksfoot. In the Cape Colony and the Transvaal it has proved one of the hardiest of the true grasses, but so far, it has not done so well here. Further trial will be necessary, therefore, before a definite opinion can be expressed.

Other pasture plants and grasses tested were Perennial Rye Grass (*Lolium perenne*), Italian Rye Grass (*Lolium Italicum*), Sheep's parsley (*Petroselinum sativum*), Sulla (*Hedysarum coronarium*), Rescue grass (*Bromus unioloides*), Soft brome grass (*Bromus inermis*), Cowgrass clover (*Trifolium pratense perenne*), and Sainfoil (*Onobrychis sativa*). Results with these are not conclusive, and it will be another season at least before they can be reported upon. It must be borne in mind, moreover, that a grass that does not thrive well in a dry loamy soil may give infinitely better results when sown on moist sandy land. It is in order that the value of these pasture plants may be tested under varying conditions throughout the country that they are included in the list of seeds offered for co-operative experiments.



Notes from the Agricultural Laboratories.

ENTOMOLOGICAL.

CIRCULAR PURPLE SCALE (*Chrysanthalus aonidum*, Linn.).—During August this scale was found on citrus trees on a plot near Salisbury. This is the first record obtained by this office of the occurrence of this species in Southern Rhodesia. The scale is about the same size and shape as the common Red Scale. It is dark purple in colour, with a more or less central orange-coloured spot. From its colour it is very conspicuous on the leaves and fruit of citrus trees. This scale may occur in other parts of Southern Rhodesia. It is common in parts of the Transvaal and Natal. Abroad, it is recorded in the West Indies, Florida, Mexico, Japan, in the Kew Gardens in London, Australia and Egypt. In the United States of America it goes under the rather unsuitable title of the "Florida Red Scale." It attacks a number of plants, amongst which may be mentioned Olive, Ficus, Bread Fruit (*Artocarpus incisa*), Bignonia, Orange, Lemon, Oleander, Rose, Orchids, Palms, etc. It flourishes mostly in a tropical or sub-tropical climate. The usual scale destroying agents should be used against this pest. For citrus trees, in an orchard where fumigation is not practised, the use of Resin Wash is recommended. (See "Notes from Agricultural Laboratories," *Agricultural Journal*, April, 1910.)

CRICKETS ATTACKING TOBACCO.—A species of cricket with destructive food habits is represented in the adjoining Plate. (The figure is life sized). This pest appears to find its most congenial habitat in light sandy soils, and this is doubtless the reason why most of the complaints of injury by it received at this office have been in connection with tobacco, though young trees have also been reported as suffering severely. All reports agree that it burrows in the soil, and that it is often present in very large numbers. It apparently forages at night, issuing from its burrow and severing leaves from the tobacco plants or entirely removing very young seedling trees. These leaves, etc., it drags to its hole to devour. Specimens of rolled-up tobacco leaves, dug from the burrows of this insect, have been submitted to the writer. These leaves were neatly rolled into a cylindrical

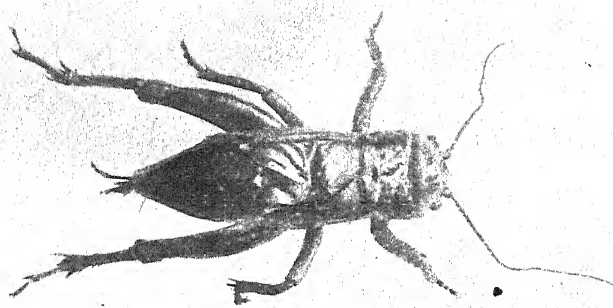
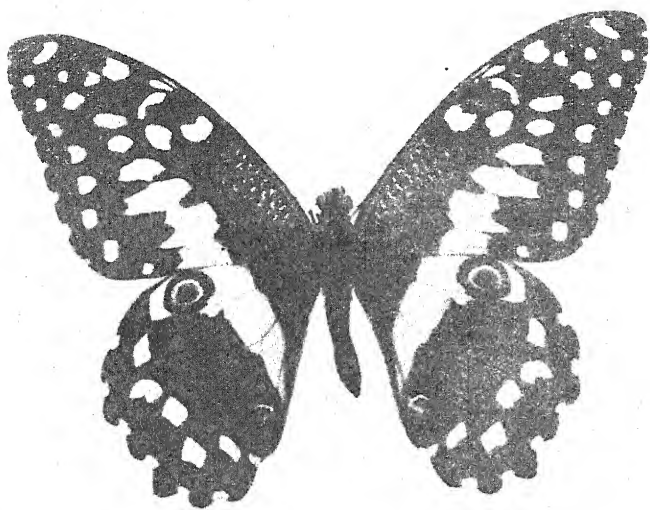
form, to fit the hole presumably, and the cricket itself was seen in one or two specimens within the cylinder, the leaves being partially devoured inside. The breeding habits have not as yet been observed, but the probability is that the eggs are deposited in the soil as is the case with most other members of the family.

The only remedy practised up to the present appears to be digging the crickets out and destroying them by hand. It is possible, however, that where they are very abundant, they could be more economically destroyed by the use of a poisoned bait, as is done against their allies, the locusts. The following is suggested as likely to be efficacious:—

Arsenite of Soda	...	...	1 lb.
Treacle or Black Sugar	...	...	2 to 4 lbs.
Water	...	...	8 gallons.

This liquid should be used to wet a quantity of bran or mealie meal, and either placed in little balls about the infested ground, or distributed broadcast. Mr. C. W. Mally, the Entomologist for the Eastern Province of the Cape Colony, has found that green stuff chopped up fine and wetted with a poisoned sweet such as the above, is a very efficient bait for cutworms when distributed broadcast about the land. The use of such a bait may thus kill two troublesome pests of tobacco at the same time. It is to be remarked that, as with locusts, the larger crickets will probably resist a fairly strong dose of arsenic. The remedy should therefore be chiefly directed against the earlier stages of the insect.

THE CITRUS BUTTERFLY (*Papilio demoleus*). An illustration of this conspicuous insect appears in these pages. It is a native of Africa and is common everywhere from the Cape of Good Hope to the Mediterranean. The adults may be met with at almost any time of the year, especially in citrus orchards. The caterpillar is known in some parts as the "Orange Dog." Its most striking characteristic is its power to extrude two reddish prongs from immediately behind its head, which give off a powerful and disagreeable odour. This action is performed when the insect suspects danger. It is a measure of self-protection; the odour warning insectivorous birds that the caterpillar is disagreeable to the palate, and probably also to the stomach. When young the larva is dark brown and white, and much resembles the faeces of a small bird, a resemblance which is also for protective pur-



1.—The Citrus Butterfly (*Papilio demoleus*).

2.—Burrowing Cricket, injurious to tobacco.

poses. Later on the larva becomes bright green marked with white and brown. It has a somewhat humped appearance due to the thickening of the second, third and fourth segments. The eggs are laid on the leaves or twigs of the trees on which the larva feeds. The greyish chrysalis is attached to a twig by its anal end, and supported more or less in an upright position by a girdle encircling the thoracic region and attached to the twig.

The citrus butterfly larvae sometimes do considerable damage when plentiful, more especially to young trees. The common remedy is to destroy them by hand. Caterpillars on trees are usually destroyed when plentiful by the application of an arsenical spray, but these caterpillars are rarely numerous enough to justify the trouble of spraying, and this measure is not known to have been resorted to for their destruction.

R. W. J.

CHEMICAL.

INFERTILE SOILS.—Only a few samples of infertile soils have so far been examined in the laboratory for the purpose of finding if the cause is due to the presence of substances injurious to plant life, but there is evidence from a few already dealt with that the infertility is in some cases due to the presence of unoxidised iron salts. Iron colours the soil yellow, red, green or blue, according to the nature of the iron compounds present; the green and blue colours, which are due to the presence of "ferrous" iron compounds, are generally confined to the sub-soil, and indicate a lack of aeration, or, in other words, bad drainage. Such sub-soils will, on exposure to the air or on burning, become yellow, brown or red, owing to the iron changing from the "ferrous" to the "ferric" condition. Soluble "ferrous" iron compounds are poisonous to plants, consequently whenever they occur within a few feet of the surface, the plants will languish or die as soon as the ferrous compounds come into contact with the roots. The best treatment in such cases is deep cultivation in order to permit the entrance of air, and a liberal application of lime; if freshly slaked lime is used, it should be applied at the rate of at least one ton per acre and ploughed under.

G. N. B.

A Report on Coffee Grown in Southern Rhodesia.

The following report on certain samples of coffee grown in the Melssetter district has been received through the courtesy of Professor Wyndham R. Dunstan, of the Imperial Institute, South Kensington, London.

The samples were collected in December, 1909, and were forwarded by this Department to the Imperial Institute for technical examination and report as to their commercial value, and were in turn submitted to a firm of London brokers for valuation.

One of the points desired to be established was the relative difference in quality of coffee grown on different classes of soil, and in particular on soil which had been originally grass veld, as opposed to bush covered land.

The following table gives a description of the soil on which the crop was grown, the colour of the bean, the percentage of broken beans present, and the market value as compared with that of Mysore and Brazilian coffee on the same day :—

Description of Soil.	Colour of Bean.	Percentage of broken Beans in Sample.	Value per cwt.
1. Fertile grey sand, originally bush clad	dull olive green	- 10 -	47 -
2. Dark red dolerite sand	dirty green	- 6 - 43 -	to 44 -
3. Rich grey sand, originally bush clad	light greyish green	- 18 -	42 - to 43 -
4. Rich red loam, Northern limit of coffee-growing area	brownish grey green	- 14 -	43 -
5. Deep rich dolerite soil, originally bush clad	dull greyish green	- 7 -	45 -
7. Light sandy loam 1 ft. deep with stiffer sub-soil	pale brownish green	- 10 -	44 -
8. Red sandy loam, originally grass veld	dirty pale olive green	- 14 -	46 -
9. Light loam, originally grass veld	dull pale olive green	- 14 - 45 -	to 46 -
10. Rich red sandy loam	dirty olive green	- 3½ - 35 -	to 37 -
Mysore coffee, No. 1	dirty olive green	- nil -	75 -
Mysore coffee, No. 2	dirty olive green	- nil -	78 -
Brazil (Santos) ordinary	dirty brownish green	- 7 -	35 -

Samples Nos. 1, 3, 4, 5, 7, 8 and 9 were reported on as free from pulp, foreign matter and dirt, but sample No. 2 contained an excess of foreign matter, chiefly husks; and No. 10 was free from pulp, but contained a large amount of broken leaves, bark, twigs, etc. The Mysore and Brazilian coffee were in this respect of the quality required by the market. Uniformity of size of berry is another important point, and samples Nos. 1 and 8, priced at 47s. and 46s. respectively, were said to be fairly uniform in this respect.

The conclusions which may be drawn from this table are that differences of soil have had comparatively little effect in influencing the quality of the coffee, the considerations which have mainly governed the market value being percentage of broken beans, amount of foreign matter in the sample and evenness of grading.

In the report particulars are given of the number of beans required to fill a 100 c.c. measure and also of the weight of 200 beans. From these figures it appears that the Rhodesian grown bean is smaller and consequently lighter than the Mysore but larger and heavier than the Brazilian grown coffee.

	No of Beans to fill a 100 c.c. measure	Weight of 200 Beans—grams
Rhodesian (average of 9 samples)...	646	25½
Mysore	465	37½
Brazilian (Santos)	718	22½

The closing remarks of the report may be quoted as follows:—

“It will be seen from the foregoing descriptions, that these Rhodesian coffees are smaller than typical Mysore coffee. Their principal defects are, the large percentage of broken beans present in most cases, and the amount of dirt contained in several of the samples, notably in No. 10. The first of these defects is due to the primitive method of cleaning adopted, whilst the second could probably be avoided by merely sifting or winnowing the coffee. Better prices would be realised if the beans were graded according to size; almost all the present samples showed great variation in this respect.”

The brokers added that the price quoted for these samples are such as would be realised for fair quantities of coffee and not for small lots.

For coffee fruits, "cherries," there is no demand in the United Kingdom, the only market being for shelled and cleaned beans.

There seems no reason to doubt that Rhodesian coffee would meet with a ready sale on the European market, but for an export trade—just as with maize—greater care must be taken in winnowing and grading in order that the coffee may be placed on the market free from foreign matter and particles of broken beans. Were this done, the value placed on Rhodesian coffee would probably be considerably higher and might well be sufficient to encourage an export trade.

PREPARATION OF COFFEE FOR MARKET.

We are further indebted to Professor Dunstan and to his indefatigable Staff for the following memorandum on the subject of preparing coffee for market, which should prove of real value to present and intending planters of this crop.

MEMORANDUM ON THE PREPARATION OF COFFEE.

Two methods are employed in converting coffee fruits, or "cherries," into saleable coffee, viz., (1) the Dry Method, and (2) the Wet Method. The choice of method is determined by various considerations, *e.g.*, the duration of the crop season; the abundance of labour, and the availability or not of a good supply of water. Of the two, the wet method is preferable, and should be employed if possible.

(1) *The Dry Method.*—This method has the advantage of being serviceable when cherries in different stages of ripeness have to be handled at the same time, owing to the crop ripening irregularly, to labour being scarce or dear, so that successive gatherings are impracticable, or to the lack of a good supply of water.

The gathered cherries are spread in a thin layer on open drying grounds. The drying ground should preferably be made of brick or cement, although clay will serve. The cherries are turned over, made into heaps, and spread out again, to ensure even exposure to the sun. After the first

two or three days, when the coffee is beginning to dry, it should be placed under cover at night if the dews are prevalent, and exposed again on the drying floor next day. It should also be protected from rain. (Some very small producers expose the cherries on wooden trays, which are easily handled and carried bodily under cover when necessary). When the cherries become quite dry, they may be stored. This method of drying is tedious, taking usually about three weeks, even under good conditions.

The next stage is to remove the dried husks from the cherries. Immediately before attempting this, the cherries should have a final sunning to ensure their integuments being crisp. Then, without employing machinery, they can be threshed with a flail, or pounded in a large mortar. The resulting material requires winnowing to separate the seeds, or coffee beans, from the broken-up outer portions of the berries. This can be accomplished by throwing the whole mass up in the air during the prevalence of a breeze, when the lighter waste materials are carried away.

The threshing or pounding of the dried cherries usually leads to the breaking of a considerable proportion of the beans, and to avoid this, the use of a machine (the "Huller") to remove the husks from the cherries, is advisable. The material from this machine can be winnowed by hand as above, but the use of a winnower or fan is preferable.

These two machines, the "huller" and the "fan," can be obtained of a size requiring only hand power and suitable for a small producer, but larger machines are also available.

(2) *The Wet Process.*—This is the more modern method of preparation. To give the best results the berries should be *ripe*, and should be dealt with the same day as picked. As brought in from the fields, they are thrown into a vat of water, when the dry and withered cherries float and are easily separated from those which sink. On a large scale, special tanks are used from which the heavy cherries are withdrawn through an outlet at the base, thus avoiding the necessity of frequently emptying the tank. On a small scale, however, this is not essential.

The cherries are next passed through this pulping machine, which disintegrates the fleshy exterior of the fruits. The

mass of pulped cherries is passed on from the pulper to a receptacle containing water, in which it is stirred about with poles, paddles, or a revolving wheel, or other suitable device; or it may be placed in a vat with a small amount of water so that it can be trampled upon by barefooted men. More water is then added, the mass is stirred up, and the light pulp got rid of by withdrawing the water from above. The beans, still enclosed in the parchment, remain at the bottom of the vat, and are left comparatively free from pulp when the water is removed.

The parchment is still very slimy, owing to portions of the pulp, etc., remaining adherent to it. This material is removed by fermenting the coffee, for which process the beans, enclosed in the parchment, are piled up in a heap under cover, or placed in special receptacles, and left for from one to three days. The fermentation can be carried out in the washing tank, after withdrawal of the water. The parchment coverings no longer feel slippery after this operation, but slightly rough. The beans are next washed again, the parchment being now left clean. The washed "parchment coffee" is spread in a thin layer (3 to 4 inches deep) on a smooth drying ground of cement or brick and raked over several times daily at first, to ensure uniform drying.

After the first day or two it should be protected from night dews. The actual duration of the drying period is variable, and experience is requisite to determine when the coffee is in its best condition. The crop may be sent down to a port, or even exported as dry parchment coffee.

The next process is to remove the parchment. This operation may be carried out on the estate, at the port of shipment, or in the country to which the coffee is exported. The coffee, when thoroughly dry, is fed into a machine known as a "peeler and polisher." After its passage through this machine, a fan, or winnower, is necessary to separate the beans from the debris. Grading follows next, i.e., the sorting of the beans into various sizes. This can be done in a simple manner by sieves, with meshes of appropriate dimensions, or by special sizing machines, and the coffee is then in the condition of the ordinary unroasted beans of commerce.

Cookery for the Country.

(By L. C.)

A NOVEL SAVOURY OF BULLY BEEF.

Cut some thin slices of bully beef; dip each slice in melted butter, then in fine bread-crumbs, and arrange neatly in a shallow dish well buttered. On each slice put a thin layer of finely chopped pickles of any kind, and put in a hot oven until the whole is hot and crisp. Serve with fingers of toast, or rice or potato balls.

HONEYCOMBE TIMBALE OF TINNED TONGUE AND MUSHROOMS.

Cut into small dice a small tin of tongue and a small tin of black mushrooms (Leicestershire), reserving the liquor from the mushrooms. Now make a sauce with a tablespoonful of butter, a tablespoonful of flour, the liquor from the mushrooms, and a cupful of stock or milk. Flavour with salt, pepper, and paprika, add the tongue and mushroom, and stir until thoroughly mixed and well heated: then remove from the fire, stir in two well-beaten eggs, and pour the mixture into a mould prepared as below with macaroni. Cover the mould with buttered paper and steam for 20 to 30 minutes, and turn out carefully. To prepare the mould or basin: Well butter the mould, and cover all over with $\frac{1}{4}$ -inch thick rings of cold boiled macaroni of as large a size as possible. The macaroni should be boiled in salted water until soft but firm, so that it will cut well when cold: the surface of the mould when turned out looks like a honeycomb.

DEVILLED EGGS.

Toast five or six small rounds of bread and dip quickly into hot melted butter, (this is much nicer than buttering the toast in the ordinary way), and arrange on a hot dish. Put an ounce of butter in a stew-pan, with half a teaspoonful of dry mustard, one tablespoonful of chutney, one tablespoonful of Yorkshire Relish, one dessertspoon of ketchup, and a quarter of a teaspoonful of curry paste. When these are well mixed and thoroughly hot through,

lay in four hard-boiled eggs, cut in thick slices, and after a little turn them carefully. Spread the buttered toast very thinly with Liebig's Extract or Bovril, lay on the egg slices, pour over the sauce, and serve hot.

VEGETARIAN BRAWN.

(A delicious hot-weather luncheon dish.)

Boil 1 lb. of macaroni cut into half inch lengths, drain, and put into an enamelled saucepan. Pour boiling water over half a pound of tomatoes, and sieve them, leaving skins and pips behind. Add the tomato and half a pint of boiling water to the macaroni in the saucepan, chop fine a large cooked onion and add, with 2 ozs. of grated cheese, a teaspoonful of sage and parsley mixed, a tablespoonful of mushroom ketchup (or curry paste if preferred), and salt and pepper to taste, to the macaroni and tomato and stir the whole until it boils. Then mix in 2 ozs. of cornflour or maizena, dissolved previously in a little water, and boil for a few minutes, stirring well. Take from the fire and add two raw eggs, one at a time, and beating hard all the time, and lastly, stir in six hard boiled eggs cut in slices or dice. Press the mixture into a mould, and set on ice or in a cool place until quite stiff. Turn out and garnish with lettuce or parsley.

APRICOT TARTS.

Roll out some puff paste about a quarter of an inch thick, then with a fluted or plain cutter, about 3 inches across, cut out as many cases as you require to fill, cut half through each round with a smaller cutter, about two inches across, and bake. Then remove the centre piece, taking out as much of the soft paste as you can without damaging the bottom or sides. Take some tinned apricots, pour off the syrup, and stew it with a little lemon peel and cinnamon, add the apricots and simmer gently for twenty minutes; lastly, take out the fruit, and stir in a very little melted gelatine. When nearly cold put a piece of apricot in each case and pour a little of the syrup over.

CREAM CAKES.

Put in an enamelled pan half a tumblerful of water, and an ounce of butter. When it comes to the boil, stir in gradually two tumblerfuls of flour. Then take off the fire,

and add two eggs, one first, and then the other, beating well between each. Drop dessertspoonfuls of this mixture on to a well greased paper, and bake in a good quick oven for about twenty minutes. When cold, split open at one side, and fill with the following mixture: 3 ozs. of fresh butter, four tablespoonfuls of castor sugar, and a few drops of vanilla essence, whipped together to a light cream. Lastly dust the cakes with some finely powdered sugar on top.

LEMON SAVOURY SANDWICHES.

Melt two ounces of butter at a slow heat, stir into it a small teaspoonful of mustard, a pinch of cayenne pepper, a tablespoonful of lemon juice, and a good pinch of curry powder. When well mixed together and cooked smooth, set the paste aside to grow cold before using. Then spread thinly on slices of bread and butter to form sandwiches, serve on a napkin, garnished with sprigs of parsley.

SAVOURY PANCAKES.

Put together in a basin 2 oz. flour, half a teaspoonful grated lemon rind, a quarter of a teaspoonful each of salt and mixed herbs, some pepper, and a small onion or shalot very finely minced. In another basin beat together 2 eggs and half a pint of milk, and add gradually to the flour, etc., stirring well with a wooden spoon until thoroughly mixed and free from lumps. Take a perfectly clean smooth frying pan, and melt in it just enough butter to grease the pan well, pour in just sufficient of the batter to cover the bottom, and shake the pan over a hot fire loosening the edges from time to time with a knife. When brown on the under side turn or toss over and brown on the other side, then fold over and lay on a hot dish. This quantity of batter should make six pancakes. These are also delicious with bacon as a breakfast dish.

CHEESE DUMPLING.

Parboil a large Spanish onion, and chop up small. Grate six ounces of cheese and mix it with the chopped onion, and add pepper and salt, and if liked a pinch of mixed herbs or a grate or two of nutmeg. Make two small rounds of plain short paste, put the cheese and onion mixture between, wetting and closing the edges all round. Flour a cloth well, tie the dumpling in it, and boil from one and a half to two hours.

Dates of Meetings of Farmers' Associations, Southern Rhodesia (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1910.		
			Oct.	Nov.	Dec.
Mashonaland	Salisbury	W. H. Williamson	1	5	3
Rho. Landowners' Farmers'	Bulawayo	Harry Hopkins	27	24	29
Manica	Umtali ...	P. B. Snashall	1	5	3
Midlands	Gwelo ...	M. L. Price	...	...	...
Lomagundi	Eldorado Mine	A. Smith	8	12	10
Makoni	Rusapi	F. A. Lapham	12	9	14
Marandellas	Marandellas	C. M. Wright, Shortlands	†	†	†
Matopos	Matopos...	W. E. Dowsett	...	...	4
Plumtree	Plumtree	J. Reid-Kowland	6	...	...
Victoria (Eastern) ...	Good Hope Farm	F. A. Readman	...	5	...
Enkeldoorn	Enkeldoorn	A. J. Liebenberg	29	26	31
Figtree	Figtree ...	J. I. Kirschbaum	8	...	...
Melsetter	Melsetter	H. A. Oxenham	7	...	...
Gazaland	Chipinga	A. L. Slater	...	3	...
Hartley	Hartley ...	S. J. Knutzen	8	5	10
Mazoe	Mazoe ...	V. W. Fynn	...	26	4
Headlands	Headlands	H. Barnes Pope	...	...	...
Makwiro and Norton	Makwiro	F. R. McLellan	20	...	...
*Macheke	Macheke	A. C. Fountain	...	...	...
*Victoria	Victoria...	James Rutherford	...	...	...
*Kimberley Reefs ...	Kimberley Reefs	G. O. Smith	...	...	...
*Somabula	Dewhurst, Somabula	S. Annandale	...	...	...

Dates of Meetings of Associations marked (*) are uncertain.

† First Saturday in every month

Correspondence.

THE EDITOR RHODESIA AGRICULTURAL JOURNAL.

Sir,—My attention has been drawn to a sentence in the Director of Education's article on "Rural Education in Rhodesia" (printed in the August Journal) which may give rise to some misunderstandings.

Concerning "farm schools" Mr. Duthie writes "several have been started along the railway line from Bulawayo to Plumtree, but owing to the migration of the farmers these have had to be discontinued."

As the term "farm school" is an elastic one it may be thought by some that this School is included in those which have been discontinued. On the contrary it is in a more flourishing condition than it ever has been. As however its finances are controlled by a representative Council and not directly by the Education Department (though grants are drawn from the Government on the same terms as by other schools) it was not mentioned in the list of Boarding Schools given by Mr. Duthie.

I may therefore be allowed to say that the healthy site, large grounds, country life and diet, and the thoroughness with which all aspects of Education (and not only the literary side) are dealt with, entitle the school to claim that it has advantages (especially for farmers' children) over other Schools in Rhodesia.

I am,

Yours faithfully,

R. W. HAMMOND,
Headmaster.

The School, Plumtree,
September 21st, 1910.

Agricultural Reports for July and August, 1910.

This period has been occupied for the most part both by Europeans and Natives in shelling. The European mealie crop has exceeded expectations, especially in the Mazoe district where a bumper crop has been reaped. The native mealie crop is not up to the average and in some parts was a complete failure, but on the other hand what are known as native crops have, on the whole, done very well, especially Rukweza, of which there is a heavy crop this year. Prices are likely to rule slightly lower than last year, and traders of the M'rewa District have been buying mealies from the natives at from 3s. to 4s. per bag. The supply of hay and forage is short of the demand and good prices are being realised, especially for the latter.

Grass fires are reported from several districts as doing considerable damage, stock suffering in consequence from want of grazing. In the Insiza district two district fire lines have been burnt under the direction of the Native Department, one 70 miles and the other 12 miles long. They have proved a very efficient check to fires, and the extension of this system to other districts is greatly to be advocated.

Wild beasts have been responsible for a heavy toll of losses of stock; in Chibi district thirty head of cattle, twenty pigs and several sheep and goats were killed by lions; in Ndanga five head of cattle; in Melsetter five head of cattle; in Wankie sixty head of sheep and goats; and in Darwin twenty-six goats. In Gwanda district wild dogs have done some damage.

In Matabeleland labour during these months was only slightly short of requirements, but in Mashonaland a shortage was reported from most districts. The outlook at the present moment is far from reassuring and organised efforts are being made to bring more local labour into the market.

During August regulations were published providing for the admission of cattle from N.W. Rhodesia on similar terms to those obtaining for cattle from Nyasaland and N.E. Rhodesia. About 8,000 head of cattle are now awaiting removal to the quarantine area on the Gwaai.

Market Reports.

The London markets for produce, according to the last mail advices, show a slight improvement, and price for S.A. White afloat are quoted at about equal to 10s. per 200 lbs. free on rail this end.

In the local market maize shows a slight decline, and oat forage, potatoes, munga, and monkey nuts are offering freely at about the same price to 6d. per bag decline.

The following are the latest market quotations received:—

Jas. Lawrence & Co. (Transvaal), Ltd., 15th Sept., 1910:—

Barley, per 150 lbs. ...	13 6		Peas, per 200 lbs. ...	15 0	16 6
Beans, per 200 lbs. ...	15 0	25 0	Potatoes, per 150 lbs. ...	8 0	14 0
Bran, per 100 lbs. ...	6 6	7 6	Rye, per 200 lbs. ...	11 0	12 0
Chaff, per 100 lbs. ...	2 6	4 0	Salt, per 200 lbs. ...	4 0	4 6
Forage (T'vaal), 100 lbs. ...	6 0	7 0	Boer Meal, sifted, per 200 lbs. ...	21 0	27 0
" (O.R.C.) " ...	5 0	5 9	Wheat, per 200 lbs. ...	16 0	21 0
" (Colonial) " ...	6 9	7 0	Butter, per lb. ...	1 0	1 4
Hay, per bale ...	1 0	1 6	Eggs, per dozen ...	10d	1 0
Kaffir Corn, White, per 200 lbs. ...	11 0	12 0	Ducks, each ...	2 6	3 6
do. Mixed ...	11 6	12 6	Fowls, each ...	1 6	4 0
Lucerne, per 100 lbs. ...	4 6	6 3	Geese, each ...	4 0	4 6
Manna, per 100 lbs. ...	5 9	6 3	Turkeys, each ...	4 6	14 6
Mealies, (S.A.), White, per 200 lbs. ...	7 0	8 0	Pigeons, each ...	8d	10d
Mealies, (S.A.), Yellow, per 200 lbs. ...	7 6	8 4	Slaughter Oxen ...	£8	£14
Oats, per 150 lbs. ...	9 6	11 6	Sheep, each ...	15 0	20 6
Onions, per 120 lbs. ...	12 6	16 9	Pigs, per lb. ...	2½d	4¼d

Jas. Lawrence & Co., Ltd., Kimberley, 16th Sept., 1910:—

Bran, per bag 100 lbs ...	6 0	6 6	Onions, per bag 120 lbs...	11 0	14 0
Barley, per bag 163 lbs ...	9 6	12 6	Potatoes, 163 lbs. ...	2 6	7 0
Beans, Sugar, bag 203 lbs	26 6	30 6	Potatoes, O.F.S. ...	7 6	12 0
Beans, Kafir, 203 lbs ...	20 0	21 0	Tobacco, good, per lb ...	4d	7d
Chaff, Colonial, bale ...	6 6	9 6	Tobacco, inferior, per lb	1d	2d
Chaff, Colonial, pressed, 100 lbs ...	3 0	3 6	Wheat, per bag 203 lbs...	18 6	21 6
Forage, good, per 100 lbs	5 6	5 9	Butter, fresh, per lb ...	1 6	2 0
Kafir Corn, S.A., mixed	10 6	11 6	Butter, second quality ...	1 0	1 3
Kafir Corn, White ...	10 6	11 6	Eggs, per dozen ...	8d	10d
Boer Meal, Colonial, unsifted ...	23 6	26 6	Ducks, each ...	2 3	2 9
Boer Meal, Colonial, sifted	26 6	29 6	Fowls, each ...	1 6	2 0
Flour, Colonial, per bag 100 lbs ...	16 0	16 6	Turkeys, each ...	3 6	8 6
Yellow Mealies, Colonial, 203 lbs. ...	8 9	9 6	Salt, per bag ...	3 0	4 6
White Mealies, Colonial, hard, 203 lbs ...	8 3	8 8	Lime, per bag ...	3 0	4 0
White Mealie Meal, 183 lbs	9 0	9 6	Naartjes, per 100... ...	1 6	4 6
Oats, per bag 150 lbs ...	10 0	10 6	Pineapples, per doz ...	1 0	2 0
Lucerne Hay, per 100 lbs	5 3	5 6	Oranges, per 100... ...	1 6	5 0
			Beans, green, per lot ...	4d	9d
			Cabbages, per dozen ...	2 0	5 0
			Cauliflowers, per doz ...	2 0	7 6
			Pumpkins, per doz ...	4 0	12 0

SLAUGHTER.

Cows, good, 450 lbs upwards ...	£7/10	£9	Lambs, 30 lb ...	8/0	10/0
Calves ...	£2	£3/10	Hamels, 40 lb to 45 lb ...	14/0	17/0
Oxen, good, prime, 600 lbs upwards ...	£10/10	£13/10	Kapaters, good, 65 lb ...	14/0	18/0
Oxen, medium ...	£8/10	£9/10	Horses Riding & Draught ...	£10	£25
Oxen, Trex ...	£7	£8	Mules ...	£20	£22/10
Cape Sheep, good ...	14/0	17/0	Donkeys, Geldings ...	£4/10	£7
			Donkeys, Mares ...	£5	£7/10
			Pigs, (clean), per lb ...	3d	3¼d

Whitfield & Co., Salisbury, 26th Sept., 1910.—

Cows, good milkers ...	£25	£35	Mules, inoculated ...	£30	£35
Cows, Native ...	£9	£10	Mules, not inoculated ...	£25	£30
Heifers, Colonial ...	£7	£8	Horses ...	£25	£30
Heifers, Native ...	£6		Donkeys, Colonial ...	£8	£9
Trained Oxen, large ...	£12	£12/10	Donkeys, G.E. African ...	£7	£8
Trained Oxen, ordinary ...	£10/10		Sheep, Colonial ...		24 -

Wightman & Co., Ltd., Salisbury, 30th Sept., 1910:—

Mealies, per 203 lbs ...	7/6	8/6	Manna Hay, per 100 lbs ...	7/0	8/0
Rapoko, per 203 lbs ...	9/0	10/0	Beans, per 200 lbs ...	20/0	
Oat Forage, per 100 lbs ...	9/6	12/6	Monkey Nuts, shelled, p. lb ...	13¼d	
Onions, per lb ...	2½d		do. unshelled, per 83 lbs ...	8/0	
Potatoes, per lb ...	¾d	1d	Wheat, per 200 lbs ...	30/0	
Munga, per 203 lbs ...	10/0	11/0	Oats, per 153 lbs ...	29/0	
Salt, per 200 lbs ...	19/0				

Veterinary Report for the Months of July and August, 1910.

SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks occurred.

On the farm Stamford 72 head of cattle were left at the end of August. The mortality to this date, including 36 head slaughtered by the butcher, was approximately 110 head.

The remainder of the cattle on the Brickfields-Makabusi area were removed to the Letombo temperature camp. No case of disease occurred amongst them during their period of quarantine.

MALLEIN TEST.—The following animals were tested with Mallein on importation :

Horses...	...	...	2
Mules ...	...	...	36

One mule reacted and was destroyed.

HORSESICKNESS.—Several cases of this disease occurred.

BULAWAYO.

AFRICAN COAST FEVER.—No fresh outbreaks occurred.

At Crocodile Valley farm the position in regard to cattle on the infected veld at end of July was as follows :—

Of Mr. Rorke's cattle there were 54 left. Deaths (including some animals slaughtered) 104. The ten head belonging to native Matshya are all dead.

A fence has been erected between the old Mzingwane Reefs and Estate Coy's fence ending at Balla Balla peak, this with the fence along the boundary of Spitzkop farm makes a continuous line of fencing of over 50 miles, surrounding, at some distance, the infected area on South and East sides.

The movement of cattle in the vicinity of the infected veld through temperature camps to clean veld is progressing satisfactorily.

HORSESICKNESS.— Several cases occurred during the month of August.

REDWATER AND GALLSICKNESS.—These diseases have caused a high percentage of deaths in cattle imported from the South. In one instance only five remain out of 22 well bred animals.

BILIARY FEVER IN HORSES AND DOGS.—Several cases occurred, and treatment with Trypanblau proved very satisfactory.

STRANGLES.—This disease has been very prevalent.

GLANDERS.—The following animals were tested with Mallein on importation:—

Horses	...	...	231
Mules	...	...	338
Donkeys	...	...	544

Of these twelve horses and one mule reacted and were destroyed. The twelve horses were all in one consignment from Ficksburg, O.F.S. The Veterinary Department, Bloemfontein, was advised and on enquiry it was found that all the animals except one had been brought from Basutoland.

During the month of August a case of Glanders was discovered at Essexvale, and one on the farm Umganin a few miles from Bulawayo. Both animals were destroyed and all incontacts were tested with the result that three horses reacted and were destroyed, and two mules were detained for a further test.

UMTALI.

AFRICAN COAST FEVER.—The testing of the formerly infected area at Baradza is proceeding satisfactorily. So far none of the test cattle have shown any sign of disease.

Five head of cattle were moved from the farm Lowlands into Portuguese territory without permission, and were immediately destroyed by the Portuguese authorities.

CALF MORTALITY.—Several young calves died at the farm Tilbury; the deaths were attributed to pneumonia as the result of exposure to cold.

MALLEIN TEST.—The following animals were tested with mallein and found healthy:

Horses	...	...	4
Mules...	...	...	34
Donkeys	...	...	16

SCAB.—One outbreak.

MELSETTER.

SCAB.—Two infected flocks were placed under licence.

GWANDA.

MALLEIN TEST.—The following animals imported from the Transvaal were tested with Mallein and found healthy:

Horses	...	...	5
Mules...	...	...	8
Donkeys	...	...	80

LOMAGUNDI.

GLANDERS.—A case of Glanders occurred in a horse purchased some weeks previously in Salisbury. The animal was destroyed and several animals suspected of having been in contact with it were tested with Mallein and proved healthy.

No contagious disease reported from the other Districts in the Territory.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

Weather Bureau.

Temperatures Recorded, 1910. (Means).

	JULY.		AUGUST.	
	Max.	Min.	Max.	Min.
Bulawayo ...	69.8	42.4	75.7	48.7
Chishawasha ...	71.2	40.0	76.6	44.1
Empandeni ...	71.9	38.9	76.4	47.2
Gwelo ...	70.6	36.2	70.4	44.6
Hope Fountain ...	68.2	41.9	75.5	48.1
Melsetter ...	64.4	...	73.2	...
Plumtree ...	...	...	75.5	52.3
Salisbury ...	71.2	39.6	75.9	44.2
Umtali ...	80.7	32.4	78.3	30.0
Belingwe ...	...	...	...	...
Gwanda ...	71.0	39.4	...	...
Rhodes Matopo Park ...	69.9	38.9	76.1	49.4
Selukwe ...	...	...	...	...
Tuli ...	75.4	48.5	81.0	58.5
Victoria ...	70.0	38.2	58.4	51.6
York Farm, Inyanga ...	...	...	70.3	43.9
Victoria Falls ...	78.1	38.3	84.2	43.5
Hartley ...	77.9	38.2	81.0	46.0
Shamva Mine ...	73.4	47.3	78.9	52.3
Giant Mine, Gadzema ...	76.4	45.2	79.5	51.1
Sinoia ...	63.6	43.6	78.8	41.8

Records received of Rainfall at Stations in Southern Rhodesia, 1910.

	July	August
MASHONALAND—		
Brundret, Mazoe ... ..	.02	—
Battlefields	—	—
Banket Junction	nil	nil
Borrowdale	nil	nil
Charter (Range) ... ..	.24	nil
Chilimanzi ... ..	.25	nil
Chininga ... ..	.16	—
Chishawasha ... ..	.18	nil
Driefontein ... ..	.19	.02
Eldorado	nil	nil
Enkeldoorn ... ..	.39	nil
Eagles Nest ... ..	.24	nil
Gadzema ... ..	.24	nil
Gatooma ... ..	.25	nil
Gutu ... ..	.26	nil
Grassfell ... ..	.31	—
Hartley ... ..	.12	nil
Hallingbury ... ..	.09	—
Helvetia	3.60	.12
Inyanga (B.S.A.P.) ... ..	.19	nil
Inyanga (York Farm)	—	.17
Kanyemba	—	nil
Lone Cow Estate ... ..	.30	nil
Marendella ... ..	.25	nil
Monte Cassino ... ..	.48	nil
Macheke ... ..	.48	nil
Mount Darwin ... ..	.05	nil
M'Rewa ... ..	.34	nil
Melsetter	1.56	.21
Mazoe South ... ..	.02	nil
M'Toko ... ..	.05	nil
Morgenster ... ..	.85	.14
Rusapi ... ..	.21	nil
Salisbury ... ..	.04	nil
Sinoia	nil	nil
Sipolilo	—	nil
Stapleford	—	—
Shamva Mine ... ..	.57	.12
Summerfield, Penhalanga	nil	nil
Utopia ... ..	.87	.13
Umtali ... ..	.40	.03
Victoria ... ..	.44	.04
West Ridge	nil	.04

	July	August
MATABELELAND—		
Balla Balla ... ..	.95	nil
Bembezi ... ..	.32	nil
Bulawayo (Observatory) ...	.07	nil
Bulawayo (Govt. House) ...	nil	nil
Belingwe	—	—
Empandeni	nil	nil
Filabusi	1.20	.36
Fort Rixon ... ..	.18	nil
Gwelo ... ..	.08	nil
Gwanda ... ..	.03	—
Gwaai	nil	nil
Heaney Junction ... ..	.04	nil
Hope Fountain ... ..	.29	.01
Inyati ... ..	.39	nil
Insiza	nil	nil
Kariangwe	—	—
Malindi	nil	nil
Maxim Hill	nil	nil
Marula ... ..	.67	—
Matopo Mission ... ..	.25	nil
Nyama Ndhlovu	nil	nil
Plumtree	—	—
Que Que ... ..	.10	nil
Rhodes Matopo Park ... ..	.17	nil
Selukwe	—	nil
Shawlands ... ..	.08	nil
Syringa	nil	nil
Solusi ... ..	.03	nil
Tegwani	nil	nil
Tuli ... ..	.08	nil
Unguza	nil	nil
Umshabetsi Mission ... ..	.67	nil
Victoria Falls	nil	nil
West Nicholson ... ..	.04	nil
Wankies	nil	nil

OBSERVERS' NOTES.

CHARTER — July. — Very heavy and continuous frosts during the month, so much so that nearly all the wheat and barley sown early (in March) have been destroyed in the neighbourhood.

EAGLES NEST—July.—Grass fires all over the district in spite of the efforts of the farmers to prevent them. August.—Although grass fires have not been quite so prevalent as in the past, yet there has been no noticeable change in the condition of stock, which is comparatively in about the usual poor condition for the time of the year. Peach trees are fruiting; fig trees well into leaf; while all other fruit trees are budding.

GUTU—July.—Nothing particular to report as regards crops. The weather has been excessively cold, and summer vegetables, that have been grown at this time in previous years, were this year killed by frost. August.—Hot weather has set in very suddenly. Natives are busy threshing grain, but not yet disposing of it to traders.

GRASSFELL—July.—Wheat crops on the Umvumvumu damaged by severe frosts. August.—Wheat crops, damaged in July by severe frosts, improved during the month. Outbreaks of measles among pigs and mange among goats owned by natives occurred during the month.

MONTE CASSINO — August. — Nothing of importance happened.

M'REWA—August.—Nothing special to report. Harvesting of crops has been completed and several farmers are very busy ploughing for next season's crops. Stock is in fair condition for this season of the year. Very little hay is cut in this district for stock, which consequently suffers. Streams and springs are now very low, but there is sufficient water for all requirements.

SUMMERFIED—July.—The weather has been exceptionally cold this month. Stock has fallen off condition in consequence. Crops of Europeans and natives are off the lands. August.—Stock in fair condition, but veld becoming dry.

FORT RIXON—July.—Frosts heavier than usual for the time of the year. A number of grass fires in the last ten days. Cut worms have been very troublesome in young onions. Stock healthy and keeping in good condition. August.—Grass fires not quite so bad as usual, but there is lots of room for improvement. No disease among stock.

SHAWLANDS—July.—Frost damaged citrus trees. Cattle in splendid condition and better than in previous years. August.—Citrus and deciduous fruit trees in bloom. Big veld fires doing much damage. Cattle in nice condition.

KANYEMBA—August.—Winter crops are small in quantity, but distinctly good in quality,

Departmental Notices.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficiently general interest.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were

sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, to the Agriculturist.

TOBACCO SEED.

All enquiries for tobacco seed should be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company, Ltd., at Salisbury, Bulawayo and Gwelo.

Price, 2½d. per square yard

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of

Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

BOTANICAL SPECIMENS FOR IDENTIFICATION.

In all cases where a botanical identification is required it is of the utmost importance that the specimens reach this office in a thoroughly dry condition, free from mildew, and intact, that is not broken in pieces. Whenever possible specimens should comprise main stem or small branch, leaves, flowers, seed vessels and roots and bulbs, though these need not necessarily be on the same plant.

The colour of the flowers and the general form of the plant should be preserved by pressing and drying between two sheets of blotting paper or newspaper. Ordinary plants not excessively succulent can be dried sufficiently in three days, provided the drying papers are changed every day. A moderately light weight should be placed on the driers in order to press the specimens flat.

Correspondents are asked to supply the following particulars as far as possible.

- (a) Height and general appearance of plant or tree.
- (b) Class of soil on which found.
- (c) Locality and altitude.
- (d) Supposed use or properties.

It is advised that specimens be packed between two sheets of cardboard or thin wood, since in this way they will travel long distances without fear of injury.

DESTRUCTION OF WILD CARNIVORA, ETC.

The undermentioned rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£3 0 0
„ Leopard	£1 0 0
„ Cheetah	£1 0 0
„ Wild Dog	£0 10 0
„ Crocodile, of not less than 3ft. in length	£0 10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may purchase pure bred stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges in selecting the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year, a deposit being made, in the first instance one third of the purchase price on delivery, one third after six months, and the balance a year after purchase. The Government meets risks on rail and until delivery is effected.

Recent purchases include 20 bulls and 65 heifers, comprising Shorthorn, Friesland, Devon and Afrikaner breeds; 180 Persian sheep, and a small number of pigs. Applications for high-class stud stock only will be entertained.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £200.

2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Board, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspect-

ed and approved by the Director of Agriculture or an officer deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars, together with plans and specifications, can be obtained.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice. All applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to

obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

PRIZES FOR BOTANICAL COLLECTIONS.

1. The undermentioned prizes are offered by the Department of Agriculture to pupils in schools throughout Southern Rhodesia for the best collection of dried specimens of plants of economic importance growing within the Territory.

2. Several scholars may join together for the purposes of the collection. Competitors need not personally have collected all the specimens or the facts concerning them.

3. Prizes will be awarded for—

Section 1.—A general collection.

Section 2.—A special collection of botanical specimens of indigenous forest trees, tall growing shrubs and creepers.

Section 3.—A special collection of specimens of the indigenous food plants cultivated or used by natives.

4. The prizes will be—

		1st	2nd	3rd
Section 1.	...	£5	£3	£2
Section 2.	...	£3	£2	£1
Section 3.	...	£3	£2	—

5. Competing specimens may be sent in any time up till 30th April, 1911.

6. Further particulars may be obtained on application to the Director of Agriculture, Salisbury.

CO-OPERATIVE EXPERIMENTS.

In continuation of the system of co-operative experiments, the undermentioned seed will be available from September onwards, for free distribution in small quantities to any *bona-fide* farmer resident in Southern Rhodesia. Seed is supplied f.o.r. Salisbury—experimenters undertaking to forward a faithful report on the result of the experiments at the close

of the season, on forms supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to each applicant.

All applications to be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

Maize.—Ladysmith white.

Leguminous Crops.—Lucerne, Egyptian clover, Crimson clover, Velvet beans, Cowpeas, Vetches, and Lupines.

Summer Cereals.—Victoria wheat, Bobs' rust-proof wheat, Sidonian oats, Rye, Egyptian rice, Boer manna, and Japanese millet.

Winter Pasture Plants and Grasses.—Sheeps burnet, Sanfoin, Cocksfoot, Tall fescue, Cowgrass clover, Paspalum, and Phalaris bulbosa slips.

Miscellaneous Seeds.—Virginia pea nuts, Castor oil, Linseed, Cotton and Broom Corn.

FORESTRY: SALE OF SEEDLING TREES.

It is anticipated that the undermentioned seedling trees will be available for sale from December onwards. The trees are grown on the Experiment Station, Salisbury, and will be sold at a price of 1d. each or 8/4 per 100 f.o.r. Salisbury. With the exception of one or two hardy kinds, the trees will be grown in tins and will be placed on rail in this condition. If required to be sent by Agricultural Parcels Post, they will necessarily have to be removed from the tins, but this method of forwarding is not recommended.

Orders must be accompanied by cheque or Post Office Order for the necessary amount, and the Department is unable to reserve trees unless payment has been received. Orders should be received at least seven days before the date on which despatch is desired, and after delivery of trees to the Railway Company, the Department can accept no further liability.

As stocks are limited application should be made early, and should be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

Acacia melanoxylon	Blackwood
*Cedrela toona	Indian or Singapore Cedar
Cupressus lusitanica	Goa cypress
Cupressus guadaloupensis	Guadaloupe cypress
Cupressus semper-virens	Common cypress

* <i>Dalbergia sissoo</i>	Indian sissoo
<i>Eucalyptus bicolor</i>	Bicolor gum
<i>Eucalyptus citriodora</i>	Lemon scented gum
<i>Eucalyptus ficifolia</i>	Red-flowering gum
<i>Eucalyptus longifolia</i>	Woolly-butt gum
<i>Eucalyptus polyanthema</i>	Red box tree
<i>Eucalyptus rostrata</i>	Rostrata gum (Red gum)
<i>Eucalyptus saligna</i>	Saligna gum
<i>Eucalyptus tereticornis</i>	Tereticornis gum
<i>Eucalyptus viminalis</i>	Manna-gum
<i>Grevillea robusta</i>	Silky Oak
<i>Jacaranda mimosifolia</i>	Jacaranda
<i>Juniperus Bermudiana</i>	Bermuda pencil cedar
<i>Juniperus monosperma</i>	
<i>Juniperus procera</i>	East African Cedar
<i>Pinus canariensis</i>	Canary pine
<i>Pinus halepensis</i>	Aleppo pine
<i>Pinus insignis</i>	Monterey pine
<i>Robinia pseudacacia</i>	Locust acacia

Hedge Plants.

<i>Abergia caffra</i>	Kei apple
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*—These trees are sufficiently hardy to be transplanted direct from seed beds, and are not therefore sold in tins.

SALE OF PASPALUM PLANTS.

Roots of this valuable winter pasture grass, suitable both for moist and dry situations, will be available for sale from December onwards at the rate of 5/- per 1,000 slips, f.o.r. Salisbury. A root can be broken up into from thirty to fifty or more slips, and when ordering, the number of slips required should be stated. Applications accompanied by remittance to be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

Farm Science, by J. E. Wing and others.

The Possibilities of Rhodesia as a Citrus Growing Country,
by R. Mellwaine, M.A., LL.B.

Winter Feeding of Farm Stock, by H. Godfrey Mundy.

Ensilage, by H. Godfrey Mundy.

The Conservation of Kraal Manure, by H. Godfrey Mundy

The Preservation of Butter.

Rhodesian Standard Types of Maize and their points, by H.
Godfrey Mundy.

Requirements in sending Botanical Specimens to the Depart-
ment for identification.

CROPS.

Cotton Cultivation, by J. L. Stinson.

The Ground-nut or Pea-nut, by H. Godfrey Mundy.

Maize Growing, by H. Godfrey Mundy.

Tobacco, by G. M. Odium.

Flax, *Linum usitatissimum*, by C. E. F. Allen.

Possible Rotation of Crops for Southern Rhodesia, by H.
Godfrey Mundy.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.

Importation of Plants, etc., Regulations, by Rupert W. Jack,
F.E.S.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

The Tsetse Fly, by L. E. W. Bevan, M.R.C.V.S.

Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.

The Relationship of Ticks and Disease, by Rupert W. Jack,
F.E.S.

The Head Smut of Maize, (*Sporosporium reilianum*), by H.
Godfrey Mundy.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.

Black Orange Aphis, by Rupert W. Jack, F.E.S.

Citrus Pyslla, by Rupert W. Jack, F.E.S.


Maize Stalk Borer or Mealie Grub, by Rupert W. Jack,
F.E.S.

Regulations affecting the Importation of Potatoes, by Rupert
W. Jack, F.E.S.

VETERINARY.

- Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Interim Report on the Animal Trypanosomiasis of Southern Rhodesia, by L. E. W. Bevan, M.R.C.V.S.
Wireworm or Hairworm in Melssetter District, by E. M. Jarvis, M.R.C.V.S.
Accidents to Calves after Calving, by J. M. Sinclair, M.R.C.V.S.
Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. F. MacGregor.
African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition).
Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.
Strangles, by F. D. Ferguson, M.R.C.V.S.
Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

- Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.
How to make use of the Fencing Ordinance, 1904, by N. H. Chataway.
Government Aid in Fencing.
Special Rates for the Benefit of the Farming Community in Southern Rhodesia.
The Time and How to Find it, by Rev. Father Goetz, S.J.
Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.
Plans and Specifications for Cattle Dipping Tanks.
Prizes and Rules for Competition for Collections of Plants of Economic Importance.
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Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue :—

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An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Ordinances.

Ordinance No. 9, 1904]

[Promulgated 5th August, 1904

AN ORDINANCE to prevent the spread of Diseases amongst Animals.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

PART I.

GENERAL.

1. The Laws mentioned in the First Schedule hereto and so much of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance shall be and the same are hereby repealed, except as to things done, offences committed, or proceedings commenced and pending at the time of the commencement of this Ordinance, and except as in the next succeeding section is excepted.

2. Notwithstanding such repeal as aforesaid, it is hereby provided that:—

- [1] all areas heretofore declared to be infected areas shall be and remain infected areas for the purposes of this Ordinance, until withdrawn as such, or the limits thereof be altered or varied by the Administrator.
- [2] all acts done and appointments heretofore made for the purposes of the Administration of such repealed laws, or any of them are confirmed, and shall continue for the administration of this Ordinance until cancelled, altered, or varied as aforesaid.
3. In the interpretation of this Ordinance and any Regulations framed thereunder, unless the context otherwise requires, the following terms shall have the meaning set opposite to each respectively:
 - [1] "Animal" means any horse, gelding, mare, foal, mule, ass, camel, bull, ox, cow, heifer, calf, sheep, goat, pig, ostrich, domesticated antelope, or domesticated zebra.
 - [2] "Cattle" means bulls, cows, heifers, calves and oxen, and includes domesticated antelopes.
 - [3] "Land" includes buildings, premises and enclosures.
 - [4] "Controller of Stock"; any officer appointed by the Administrator to administer in chief, under such designation, the provisions of this Ordinance.
 - [5] "Chief Inspector"; any Veterinary Surgeon appointed to administer this Ordinance generally under the Controller of Stock, and direct all other officers.
 - [6] "Native Commissioner" includes an Assistant Native Commissioner or any officer or person specially authorised by the Administrator to exercise or discharge the functions of Native Commissioner for the purposes of this Ordinance within any Native Reserve or within any other area defined by the Administrator.
 - [7] "Magistrate" includes Assistant Magistrate, and for the purposes of Sections 11, 12, 15 and 16, any other officer appointed by the Administrator to perform the duties or discharge the functions of a Magistrate in relation thereto.
 - [8] "Inspector"; any Veterinary Surgeon or other person appointed to inspect and deal with animals and land for the purposes, and under the provisions of this Ordinance.
 - [9] "Sub-Inspector"; any person appointed as Sub-Inspector to inspect and deal with animals and land under the provisions of this Ordinance.

- [10] "Inoculating"; the inoculation in such manner as the Administrator may by notice in the *Gazette* direct.
- [11] "Quarantining" (as regards animals); a declaration under the provisions of this Ordinance that animals may not be removed from or taken to certain land.
- [12] "Quarantining" (as regards land); a declaration under the provisions of this Ordinance that no animals may be taken to or removed from such land.
- [13] "Proprietor" (respecting land); the person to whom such land may belong, or the lessee or occupier of such land, or the Mayor or Chairman of the Municipal Council, or Chairman of the Sanitary Board or Village Management Board, in respect to land under the control of such Council or Board.
- [14] "Owner" (respecting animals); the person to whom such animal may belong or the person in whose control such animal may for the time being be, or the occupier or lessee of land on which such animal shall then be with his knowledge or consent.
- [15] "Lungsickness"; contagious pleuro-pneumonia of cattle.
- [16] "Redwater"; bovine malaria or tick fever.
- [17] "Glanders" includes Farcy.
- [18] "Destructive Disease"; any disease in animals mentioned in this Ordinance, or declared by the Administrator by notice in the *Gazette* to be a disease to which the provisions of this Ordinance are applicable.
- [19] "Vendor" (in Sections 35 to 51, inclusive of Part IV. of this Ordinance, referring to lung-sickness); any person who sells or offers for sale or disposal to another any animal or cattle, provided that [with regard to the 43rd Section of this Ordinance] the word "Vendor" shall in all cases, where the person instructing any Agent, Auctioneer, or Market Master to sell or dispose of cattle resides within Southern Rhodesia, be taken and deemed to mean the person so instructing the said Agent, Auctioneer, or Market Master; but when the person so instructing the said Agent, Auctioneer, or Market Master resides beyond the boundaries of Southern Rhodesia then the said Agent, Auctioneer, or Market Master so instructed shall be deemed and taken to be the "Vendor" of such cattle for all the purposes of this Ordinance, unless in the case of an Auctioneer or Market Master, such Auctioneer or Market Master shall, before offering each lot of cattle, announce that such cattle are from beyond the said boundaries, and shall not refuse to inform any person asking him during the time the cattle in question are being offered for sale, whether such cattle are from beyond the said boundaries or not.

4. The provisions of this Ordinance shall extend and apply to the following destructive diseases:—

- [1] African Coast Fever.
 Anthrax—or Meltziekte.
 Foot and Mouth Disease.
 Glanders and Farcy.
 Heartwater.
 Lungsickness—or contagious pleuro-pneumonia of cattle.
 Mange, in horses, mules, donkeys and camels.
 Pyæmia—or Epizootic Lymphangitis.
 Redwater.
 Rinderpest.
 Swine Erysipelas.
 Swine Fever.
 Symptomatic Anthrax—or Sponsezeikte.
 Tuberculosis.
- [2] Scab, in sheep and goats.
- [3] Rabies in dogs and other animals.

5. The Administrator may do and perform all or any of the following acts or things :—

- [1] Appoint officers for the administration of this Ordinance, by such title or designation as may be deemed applicable, including, or in lieu of those mentioned in Section 3, and define their powers and duties respectively.
- [2] By notice in the *Gazette*, declare any district or districts, or parts of one or more districts, to be an infected district or area for the purposes of this Ordinance, either generally or for any specific disease named or stated in such notice, and vary or alter the same as circumstances may require.
- [3] By notice in the *Gazette* define, on the pasture land used in connection with each township and elsewhere, convenient areas within which the quarantining of animals under the provisions of this Ordinance may be directed.
- [4] By notice in the *Gazette*, at the request, and at the expense of the local authorities of any municipality, township, or village, define an area to be described in the application for the depasturing and quarantine of animals for slaughter.
- [5] By the like notice repeal or withdraw any such notice as is in any of the last preceding sub-sections mentioned, and cancel any such appointment, or declare such district or area or any portion thereof, as the case may be, to be no longer infected.
- [6] Frame rules and regulations :—

- [a] for directing the cleansing, disinfecting or purifying of any land, or railway cattle truck, on or in which infected animals or such as may reasonably be supposed to have become infected, have been kept or conveyed ; also for the cleansing, purifying, disinfecting, or destruction of any article, including skins, which may reasonably be supposed to convey infection, or infective insects ;
- [b] in respect to the introduction permitted under or by virtue of Section 9, regarding the inoculating, quarantine, cleansing, disinfection, isolation, care, safe-keeping or other treatment of any animals so permitted to be introduced as aforesaid, which Regulations may provide for the destruction of any such animals should it be deemed expedient ;
- [c] for the examination, regarding symptoms of disease, of animals entering or about to enter or leave Southern Rhodesia, and prohibiting the introduction, movement, or export of any such animals as show any such symptoms, or of animals there are reasonable grounds to believe might convey infection, whether the said animals be visibly infected or not, and either absolutely or for a limited time, or providing generally as to all animals for all or any of such matters or things as are referred to in the last preceding sub-section ;
- [d] regulating or prohibiting the importation of bones or bone meal or organic manures, liable to introduce or spread diseases amongst animals ;
- [e] generally for the due or better administration, execution, or carrying out of the object and purposes of this Ordinance, or any of them, and defining and fixing such fees and other expenditure as may be required for its administration.

6. Should any new or further disease appear hereafter in animals, the Administrator may declare by notice in the *Gazette*, this Ordinance, or certain sections thereof, and any or all of the rules and regulations framed under the authority of this Ordinance, to be applicable to such disease.

7. The Administrator may, by notice in the *Gazette*,

[1] order that in any area defined in such notice all animals shall be compulsorily inoculated or dipped or disinfected in such manner and with such exceptions, if any, as he may in such notice direct by the owner of such animals, or failing by him, by such person as the said notice shall direct ;

[2] prohibit the holding of cattle sales or other congregations of the cattle of different owners.

8. [1] The Administrator may, by notice in the *Gazette*, prohibit the introduction into Southern Rhodesia from any place beyond the boundaries thereof, in which any destructive disease affecting animals shall be known, or be supposed to exist, or any disease to which the provisions of this Ordinance shall apply, or be declared to apply, of any animals or class of animals, or parts or carcasses of animals, or of any materials by which the spread of any disease may be disseminated, to be stated in such notice and for such time as shall be mentioned therein. The Administrator may also, in the same manner, if he consider it advisable for the prevention of the spread of disease, prohibit the movement or exportation of any animals, or parts or carcasses of animals, or of any such materials as aforesaid.

[2] Any person who shall, contrary to the prohibition in such notice contained, move, or introduce into Southern Rhodesia, or remove therefrom any such animals, or parts or carcasses thereof, or any such material aforesaid, shall for every animal, or part or carcase of any animal, or of any such material so moved, introduced, or removed therefrom, be liable on conviction to a fine not exceeding One Hundred Pounds, and, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding twelve months.

9. Notwithstanding the provision in the last preceding section contained, the Administrator may permit the introduction into Southern Rhodesia of such animals or materials as aforesaid, at such places, and subject to such restrictions, regulations and penalties for the infringement thereof, as may be imposed and provided by him, provided that no penalty so imposed shall exceed that provided in Sub-section [2] of the last preceding section.

10. The Administrator may issue instructions in consonance with the provisions of this Ordinance, or modify the said provisions with regard to natives on native reserves, situated outside a radius of 25 miles from any land owned and occupied by Europeans, and may wholly or partly suspend the operation of the provisions of this Ordinance in such areas occupied by natives, as he may deem desirable.

11. [1] Whenever it shall come to the knowledge of any Inspector, Sub-Inspector., or any persons specially authorised by the Administrator to carry out the provisions of this Ordinance as therein described, that any animal within the district is infected, or is believed to be infected, with any destructive disease, such Inspector, Sub-Inspector, or other authorised person, may forthwith place such animal in quarantine, together with such land as is necessary for its isolation. Notice of such quarantine shall be given in writing to the owner or custodian of the animal, and to the Magistrate of the district, and shall remain in force for a period of one month, unless the Administrator shall sooner, should he think fit, issue the notice referred to in Sub-Section (2) of Section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.

[2] From and after the imposition of such quarantine by an Inspector, Sub-Inspector, or other authorised person, and during such period, the owner of any quarantined animal who shall allow any such animal to stray or be removed from the land upon which it had been quarantined, shall be guilty of an offence against the provisions of this Ordinance, and liable upon conviction to a penalty not exceeding Fifty Pounds, or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months.

12. [1] Every person who shall have in his possession, or under his charge, or shall knowingly have on any land of which he is the proprietor, any animal infected with any destructive disease, shall keep such animal separate from all animals not so infected, and shall immediately give notice to the occupier of all contiguous lands [not being lands situate within the limits of any town or village] and as soon as possible thereafter shall also give notice to the Magistrate, or any Inspector or Sub-Inspector of Stock, or person specially authorised by the Administrator to carry out the provisions of this Ordinance within the district in which such animal is, or to the nearest Justice of the Peace, or Native Commissioner, that such animal is so infected, and, on failure to act in the manner directed, shall be liable to a penalty of Twenty Pounds, or to imprisonment with or without hard labour, for any period not exceeding three months, in default of payment.

[2] Any Magistrate or Justice of the Peace to whom such notice has been given shall communicate the notice received to any duly appointed Inspector, or Sub-Inspector, or other officer duly appointed to carry out the provisions of this Ordinance within the district, who shall in turn immediately report such notice to the Chief Inspector.

13. [1] Whenever any notice or information shall have been received by any Inspector, Sub-Inspector, or other officer duly appointed to carry out the provisions of this Ordinance, or it shall otherwise have come to the knowledge of any such officer, or such officer shall have reason to suspect that any animal in his district, ward, area, or location, is infected with any destructive disease, he shall, if he himself is not a qualified Veterinary Surgeon, with all convenient speed call to his assistance a Government Veterinary Surgeon; and if no such Surgeon be available, then any two persons qualified to serve as jurors, who are hereby authorised and required, upon being so called upon, to render such assistance.

[2] Such Inspector, Sub-Inspector, or other duly appointed officer, shall forthwith proceed to inspect such animals, and to hold an enquiry into the circumstances of the case: and if the Veterinary Surgeon, or any two such persons, be of opinion that such animal is infected with any destructive disease, or that it has been or may have been in contact with animals so infected, and that there is a danger of such disease spreading, such animal shall forthwith be destroyed or isolated, or dealt with in such manner as may be deemed expedient, in order to prevent the spread of such disease; or, if it is considered advisable that though such animal is not actually infected, or suspected of being infected with any such disease, but, in order to prevent the spread of such disease, it is necessary to deal with such animal as if so diseased or suspected, such animal shall be destroyed, isolated or otherwise dealt with in such manner as may be deemed expedient.

[3] The carcases of all animals destroyed under the provisions of this Ordinance, or that may have died from any destructive disease, shall be forthwith burnt by the owner thereof, at the spot as nearly as may be where the death occurred, or shall be disposed of in accordance with orders given by any official duly authorised thereto by direction of the Administrator.

[4] Any person disposing of, removing, or attempting to remove, any part of any animal destroyed, burnt or buried, or ordered to be destroyed, burnt or buried, under the provisions of this Ordinance, shall be liable, upon conviction, to a penalty not exceeding Fifty Pounds, or, in default of payment, to imprisonment with or without hard labour for any period not exceeding three months, unless the penalty be sooner paid.

14. [1] Whenever the Administrator shall, by notice in the *Gazette*, have declared any district or any area embracing or forming part of one or more districts to be an infected district or area, he may by such notice order and direct that no such animals as shall be named in such notice shall be removed from such district or area, whether the same are or are not infected with any destructive disease.

[2] The Administrator may in any such notice make such exceptions as he shall think fit with regard to the removal from or into any such district

or area of any animals not infected, or not known or suspected to be infected with any destructive disease.

15. The Magistrate of any district is hereby empowered either at his discretion, or at the request, or under the instructions of the Controller of Stock, to direct the isolation, at such place as he may fix and appoint, of any animals which he shall have reasonable grounds for suspecting to have been in contact with any animal infected with destructive disease, for such period, and subject to such restrictions, as he shall deem necessary.

16. Any Government Veterinary Surgeon, or any person thereto authorised by the Controller of Stock, Chief Inspector, or by a Magistrate, is authorised and empowered to enter into any stable or other building, or any kraal or enclosure, in which any animal infected, or supposed to be infected with any destructive disease, has been or may be kept, for the purposes of inspecting such stable, building or other premises, and any animal therein infected, or supposed to be infected with any such disease; to give orders for the proper disinfection of such premises and the furniture therein, or the destruction of such premises and furniture, if they cannot be satisfactorily disinfected, and to take such steps as may be necessary to carry out the provisions of this Ordinance, or any regulations duly made thereunder; Provided that no premises shall be destroyed unless the owner thereof states in writing that such premises cannot be satisfactorily disinfected, or the opinion of the Government Veterinary Surgeon or other person ordering such destruction is endorsed by two independent landowners whom the said Government Veterinary Surgeon or other duly authorised person is empowered to call to his assistance to decide whether the premises can be satisfactorily disinfected.

17. In no case shall any animal, infected, or suspected of being infected, with any destructive disease, except scab, be sent to any public pound; but if any such animal be found trespassing, it may be secured and isolated by the proprietor at some spot as near as possible to the place where found, or dealt with as prescribed in Sections 25 and 36 hereof, and the proprietor shall be entitled to recover from the owner all reasonable and necessary expenses which may be incurred for feeding, securing, treating and taking care of or otherwise disposing of the said animal.

18. For the purposes of the operation of any law in force relating to Pounds and Trespasses within any district or area declared to be an infected area, under the provisions of this Ordinance, the term "nearest pound" or any equivalent term or reference shall be deemed to be the nearest pound within such declared district or area; and, in case there is no pound in such district or area, the Administrator may, by notice in the *Gazette*, appoint some convenient spot a pound therein for the purposes of this Ordinance.

19. Any person offering for sale, either privately or by auction, any animal actually infected with any destructive disease, or which he has reason to believe may be so infected, shall, upon conviction, be liable to pay a fine not exceeding One Hundred Pounds, and, in default of payment, to imprisonment with or without hard labour for any period not exceeding twelve months.

The provisions of this section shall not apply to the disease of scab in sheep or goats.

20. Any person who shall send, or attempt to send by railway, or shall, without proper authority, ride, drive, lead or otherwise move, or conduct over any public road, street, square, outspan or common pasture land any animal infected, or which he has reason to suppose to be infected with any destructive disease, shall, upon conviction, be liable to a fine not exceeding One Hundred Pounds, or in default of payment to imprisonment with or without hard labour for any period not exceeding twelve months.

21. Any person who shall wilfully spread any destructive disease, or shall wilfully infect with any such disease any animal belonging to any other person, or shall be found in possession of any hide, skin, or portion of the carcase of any such animal which has died from any such disease as aforesaid,

for the purpose of infecting with any such disease the animals belonging to other persons, shall be liable to imprisonment with or without hard labour for a period not exceeding two years.

22. (1) During such time as the Administrator, under the powers in him vested by Section 5, Sub-section [2], of this Ordinance, may, by notice in the *Gazette*, prescribe and declare, and in such districts and areas as may be mentioned in such notice, no person shall remove any cattle or other animals mentioned in such notice from any place to any other place without special permission in writing either from an Inspector or Sub-inspector, or from any other officer or person authorised by the Administrator to grant such permission or authority. Any person selling, delivering, or handing over to another any animal for removal without first having ascertained that such permit has been obtained shall be deemed to have contravened this section.

[2] Such permits shall specify the place from and to which the cattle or other animals mentioned may be removed and the route by which they shall travel; provided that it shall not be competent for any official to issue a permit for the removal of any cattle or other animal from an infected to or across an uninfected area save under the authority of the Administrator.

[3] During the subsistence of any such notice as is referred to in Sub-Section (1) of this section, any Inspector or Sub-Inspector, or other person so authorised, may order and direct that any cattle or other animals, or any wagon, found travelling with cattle or other animals within an area subject to such notice shall be taken to and remain at such spot as may be by him directed, for and during such time as he shall deem fit.

[4] Any person removing any animal in contravention of this section shall be liable to a fine not exceeding Ten Pounds for every animal so removed, and in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

23. Except where in this Ordinance other provision has been expressly made, any person contravening its provisions, or the provisions of any regulations duly made and promulgated, or of any notice given or issued under its authority, or wilfully disobeying, obstructing, or misinforming any officer or person in the due execution of his duty, or in the execution of any of such provisions, shall, upon conviction, be liable in respect to each offence to a penalty not exceeding Twenty Pounds, or in default of payment to imprisonment, with or without hard labour for any period not exceeding three months unless the penalty be sooner paid.

PART II.

RINDERPEST AND OTHER DISEASES IN CATTLE.

24. The provisions of this part of this Ordinance shall extend and apply to the disease named Rinderpest in cattle, and also to such other diseases in animals as the Administrator may from time to time, by notice in the *Gazette* declare to come under its operation.

25. Notwithstanding anything to the contrary contained in any Ordinance for the time being in force relating to Pounds and Trespasses any animal found trespassing, during the subsistence of any notice issued in pursuance of Section 22 hereof, upon the property of any landowner or occupier of land, may be destroyed by the owner or occupier of the land so trespassed upon, and no compensation or damages shall be claimable for such destruction if:—

- [1] either any animal which shall be so destroyed shall be opened in the presence of two independent witnesses, who decide that such animal was infected with a disease to which the provisions of this Ordinance apply, or,
- [2] such destruction be authorised by an officer duly appointed to carry out the provisions of this Ordinance.

26. The Controller of Stock, or Chief Inspector, or other person authorised by either of them in writing, may order or direct the isolation, inoculation, or destruction of any animals which in his opinion are diseased or likely to be infected, or which it may be deemed desirable to isolate, inoculate, or destroy, in order to prevent the spread of infection.

27. No compensation shall be claimable from the British South Africa Company by the proprietor of any land for the quarantine of such land or segregation of cattle thereon under the provisions of this Ordinance, but such proprietor shall be entitled to claim from the owner of cattle so quarantined or segregated on such land such fees for their sustenance thereon as are allowed under the provisions of any law in force relating to Pounds and Trespasses, and any expenses legitimately incurred by him regarding such cattle, including the expense of inoculation: provided that the payment of such fees and expenses shall be no bar to the proprietor recovering from the owner of such cattle compensation in respect of any damages sustained by reason of such quarantine or segregation on his land.

PART III.

SCAB.

28. [1] The provisions of this part of this Ordinance shall extend and apply to the disease of Scab in sheep and goats.

[2] For the purposes of this part of this Ordinance, if one sheep or goat in a flock be infected, the whole flock shall be deemed to be infected, and any two or more sheep or goats running together shall be considered a flock.

29. [1] The Controller of Stock may from time to time appoint an Inspector or Sub-Inspector of sheep and goats, or an officer to exercise the functions of an Inspector or Sub-Inspector for any district or area which may be described by notice in the *Gazette* for the purposes of this part of the Ordinance, and may remove or dismiss any such Inspector or Sub-Inspector.

[2] Every Inspector or Sub-Inspector so appointed shall have full power, subject to such instructions or directions as the Controller of Stock may issue, either directly or through the Chief Inspector, to inspect any sheep or goats within such area as aforesaid, wherever such animals shall be kept, driven or depastured, and to exercise and discharge, within such area, the several powers, authorities, and duties hereinafter mentioned.

[3] If any person shall refuse to allow any such Inspector or Sub-Inspector to enter upon his land, or to examine any sheep or goats belonging to him, or in his care or possession, or shall attempt to impede or hinder any Inspector or Sub-Inspector from examining such animals, or shall not, when required by any Inspector or Sub-Inspector, render him all reasonable, and proper assistance, such person shall be liable to a penalty not exceeding Ten Pounds for each offence, or to one month's imprisonment, with or without hard labour, in default of payment of such fine.

30. [1] In case an Inspector or Sub-Inspector shall find any sheep or goats, or flock of sheep or goats, to be infected with Scab, he shall direct the owner, or person in charge thereof, forthwith to make proper and diligent efforts to cleanse them, by dipping or otherwise, in accordance with such directions as may from time to time be published by the Controller of Stock, and the said Inspector shall grant the owner, or person in charge, a licence to keep the animals for a period of six weeks for that purpose, such licence to be as near as may be in the form shown in the second schedule hereto.

[2] At the expiry of the period of six weeks, the Inspector or Sub-Inspector may re-inspect such animals, and should he find them still infected with Scab, he may renew the said licence for similar or longer periods, until such sheep or goats are found by him to be clean.

31. [1] If, after the second or any subsequent inspection, as are in the last preceding section mentioned, the sheep or goats are found by the Inspector

to still remain uncleanse^d, through neglect by the owner or person in charge, such owner or person in charge may be prosecuted, and, upon proof of such neglect, and upon due conviction, the said owner or person shall be liable to a fine not exceeding Five Pounds, or in default of payment, to one month's imprisonment, with or without hard labour, and for a second or subsequent conviction, to a fine not exceeding Ten Pounds, or, in default of payment, to three months' imprisonment with or without hard labour.

[2] If any such owner, or other person as aforesaid, shall fail to prove that he has caused such sheep or goats to be dipped in accordance with the directions given by the Controller of Stock, he shall be deemed guilty of such neglect and shall be liable to the penalties provided in the last preceding sub-section, and, further, the Court may direct that the said sheep or goats shall be cleansed at the expense of such owner, or person in charge, who has been guilty of such neglect, and the expenditure so incurred may be recovered in any competent Court of Law.

32. It shall be the duty of every owner, or person in charge of sheep or goats which are, or may become infected with Scab, to give notice at once of such infection, to the Inspector or Sub-Inspector of the area in which the said sheep or goats are, and to forthwith cleanse the said sheep and goats, and any such owner, or person in charge, neglecting or delaying to give such notice, or to adopt reasonable means to cleanse such sheep or goats, shall, upon conviction, be liable to a fine not exceeding Five Pounds, or, in default of payment of such fine, to one month's imprisonment, with or without hard labour, and the said Inspector or Sub-Inspector, on receiving such notice, shall issue a licence to the owner to keep the infected sheep for a period of six weeks, for the purpose of cleansing the same in terms of Section 30 hereof.

33. [1] No owner or person in charge of sheep or goats infected with Scab shall remove such sheep or goats without the permission in writing of the Inspector or Sub-Inspector, given in the form of the third schedule hereto attached, and without having previously dipped such animals, according to the directions of such Inspector or Sub-Inspector, if he so direct.

[2] If any person shall either sell or expose for sale any sheep or goats which are suffering from Scab, or which he has reason to believe have been in contact with sheep or goats infected with Scab, he shall be deemed to be guilty of a contravention of this part of this Ordinance, and shall, upon conviction, be liable to a fine not exceeding Five Shillings per head on each animal so sold or exposed for sale, or, in default of payment, to imprisonment with or without hard labour, for a period not exceeding one week in respect of each such sheep or goat, unless such fine be sooner paid.

34. Any sheep or goats found infected with Scab, within the limits of any Municipality, Township, or Village, or upon the pasture lands reserved around such Municipality, Township, or Village, shall be deemed to be trespassing therein, and, notwithstanding the provisions of Section 17, be subject to the provisions regarding trespass in any law in force relating to Pounds and Trespasses.

PART IV.

LUNGSICKNESS.

35. The duties and powers of a Sub-Inspector under this part of this Ordinance shall be the same as those of an Inspector, save and except in the following respects:—

- (1) The decision of an Inspector that an animal is infected with lung sickness, shall be deemed to be sufficient authority for its destruction.
- (2) A Sub-Inspector may order the destruction of any animal considered by him to be infected with lungsickness, if the owner or custodian of such animal acknowledges in

writing that he also considers the animal is so infected, or, failing this, if two landowners or other competent persons, called in to assist in deciding whether such animal is infected with lung sickness, shall agree that the said animal is so infected, and in such event he shall direct

- (a) that virus be procured from such animal for the inoculation of other animals which have been in contact with such infected animal, and,
- (b) in case suitable virus be not obtainable from such animal, that animals developing the disease be destroyed in succession, until one be found from which suitable virus can be obtained.

36. In cases where a Sub-Inspector has reasonable grounds to believe that an animal infected with lung sickness has been in contact with or near a herd of cattle, he may

- (1) Order the immediate quarantining of any animals which have been in contact with or near such infected animal.
- (2) Order the inoculation of any such animal in such manner as he shall direct.
- (3) Order the immediate quarantining of such land as he may direct for the depasturing of any animal ordered by him to be quarantined, and direct that every animal which shall thereafter be found infected with lung sickness, in any herd or among any animals quarantined by him, shall be separated and isolated in such manner as he shall direct, and such quarantine shall remain in force until 60 days after the separation of the last infected animal from such herd.

37. (1) In dealing with outbreaks of lung sickness upon farms owned by or rented by the proprietor or custodian of cattle which are infected with lung sickness, after all contact animals have been duly inoculated with proper virus in accordance with the requirements of this Ordinance or any Regulations framed thereunder, the Inspector or Sub-Inspector may, if he thinks fit, in the event of subsequent cases of lung sickness appearing in the herd, direct that such infected animals be isolated and kept apart in such manner as he may order from those animals that remain healthy; provided that such infected animals shall have been duly branded by the Inspector or Sub-Inspector on the left side of the neck with a brand consisting of an "L" and a broad arrow.

(2) Animals bearing this brand shall not be removed for at least three months from the farm upon which they have been quarantined, and then only under a special permit issued by an Inspector or Sub-Inspector, and only for the purpose of immediate slaughter.

(3) If any animal bearing the said brand is found without special permission, on a public road or outside of land rented or belonging to the owner of such animal, it may be seized and summarily destroyed by the Police, or any duly authorised official, or by the owner or person in charge of any land upon which it is found trespassing, and no compensation shall be recoverable therefor.

(4) This section shall apply to infected cattle owned by natives upon private farms, and to infected cattle owned by natives within native reserves, but with regard to infected cattle which are the property of any native and running in a native reserve, the provisions of this section shall be carried out under the supervision of the Native Commissioner or Assistant Native Commissioner of the District.

(5) This section shall also apply to infected cattle which are travelling after the provisions laid down in Section 39 have been complied with, in cases where an Inspector or Sub-Inspector considers that the infected animal can be effectually isolated.

38. On its appearing to the owner or custodian of any animal, or in the absence or neglect of such owner or custodian to the proprietor of any land upon which such animal is running that such animal is suffering from lung sickness, he shall immediately proceed as follows:

- (1) He shall either cause the said animal to be killed and properly examined and the carcase burnt or properly buried at a depth of not less than four feet, at a distance of not less than 200 yards from any road, and he shall in either case retain the lungs and exhibit them to the Inspector or Sub-Inspector of the area, and in case such animal is so killed by a proprietor of land not being the owner of such animal, he shall open such animal in the presence of two competent witnesses for the purpose of their examining their lungs, or
- (2) He shall completely and effectually isolate the said animal away from any road pending the examination by such Inspector or Sub-Inspector;
- (3) In either case he shall immediately report the circumstances to the Inspector or Sub-Inspector or to any other person who may be appointed to receive such report, and he shall by letter inform the Inspector or Sub-Inspector of each subsequent case of lung sickness occurring in an infected herd;
- (4) He shall immediately remove from any public road any animals which have been in contact with or running with or have been near such animal supposed to be suffering from lung sickness, and cause all such animals to be kept strictly isolated from all other cattle until the directions of such Inspector or Sub-Inspector shall have been given;
- (5) He shall state the circumstances to any persons bringing cattle towards such animals, and give notice thereof in writing to all proprietors and occupiers of any adjacent land, and the owners or holders of any cattle on such land, not being land situate within the limits of any town or village; and if any land or cattle shall have been quarantined, the said owner or proprietor shall give notice in writing of such quarantine to all such proprietors and occupiers and owners or holders of land or cattle;
- (6) He shall, in case of urgency, at once inoculate according to the general directions published from time to time, any cattle which he has segregated under the provisions of Sub-Section 4, or he shall, if time allow carry out such inoculation under the direction of an Inspector or Sub-Inspector.
- (7) In the event of stray or other cattle becoming mixed with a quarantined herd, he shall retain such cattle among them, and they shall then become subject to inoculation and quarantine.

Failure to comply with any of the above provisions shall render the offender liable to a fine of Ten Pounds or to one month's imprisonment with or without hard labour in default of payment.

39. It shall be the duty of every transport rider, or other owner of, or person in charge of cattle, in the event of lung sickness breaking out among the animals in his possession while on the road or travelling, to proceed in accordance with Sub-Sections (1), (2), (3), (4), (5) and [6] of the last preceding section; and

- (1) If the outbreak occurs while travelling through unoccupied land, he shall remove the cattle among which lung-sickness has broken out, but which are not visibly infected to at least a mile and a half from any road, pending any removal of them elsewhere; and
- (2) If travelling through occupied land, he shall remove such cattle to some suitable unoccupied ground or to an area duly set apart for the quarantining of cattle, and he may call upon any member of a Police Force, or an Inspector or Sub-Inspector to give or procure assistance to make such removal; and such member of a Police Force or such Inspector or Sub-Inspector shall direct the removal of such cattle to some such unoccupied ground or to any such area so defined.

Failure to comply with any of the above provisions shall render the offender liable to a fine of Ten Pounds or to two months' imprisonment with or without hard labour in default of payment.

40. Any owner of cattle who may allow or cause the same to be driven or herded, or to stray on any public road, street, market, or any land other than such as is his property, or of which he is the lawful occupier, knowing the same to have been inoculated within sixty days previous thereto shall be deemed guilty of a contravention of this Ordinance, and shall be liable to a fine of Ten Pounds or two months' imprisonment with or without hard labour in default of payment.

41. Any person importing, or causing to be imported, any cattle infected with lung-sickness, or knowing that they have been inoculated within sixty days previous to the arrival of such cattle in Southern Rhodesia, shall be deemed guilty of a contravention of this Ordinance and shall be liable to a fine not exceeding Fifty Pounds, or in default of payment to three months' imprisonment, with or without hard labour, and in addition shall be liable for all damages as set forth in Sections 44 and 45 of this Ordinance caused by infection from such cattle occurring within thirty days after the date of such arrival.

42. If any person shall sell or expose for sale the flesh of any animal which

(a) shall have died of lung-sickness, or

(b) shall have died from the result of any inoculation for lung-sickness.

he shall be deemed to be guilty of an offence against this Ordinance, and shall be liable to a fine not exceeding Fifty Pounds, or in default of payment to three months' imprisonment with or without hard labour.

43. Whenever any cattle shall be sold, either publicly or privately, the vendor shall be held and deemed to have warranted each and all of such cattle to be free from lung-sickness, and if any such cattle shall exhibit symptoms of lung-sickness within twenty-one days from the date of sale, exclusive of such day, the said vendor may be sued under such implied warranty for restitution of the price paid for such diseased animal; provided that such warranty shall not be held to apply in the case of cattle sold by private sale if it shall have been otherwise stipulated and agreed in writing between the vendor and purchaser.

44. If any person who shall purchase cattle at any sale, whether public or private, shall prove that he has sustained damage from lung-sickness which may have broken out within twenty-one days after the date of such purchase in the herd which was in his possession at the time he bought such cattle, and that any of the cattle so bought have shown symptoms of lung-sickness previous to any animal belonging to such herd shewing such symptoms, and if it shall be proved that the vendor was aware or had opportunity to

be aware that any of the cattle sold by him were so diseased, or had been running among cattle so diseased at or within two months previous to the time of sale, then such vendor shall be liable to make good all loss and damage which the purchaser may have sustained by reason of such diseased or infected cattle so purchased communicating the disease to cattle the property of the said purchaser, unless in case of cattle sold by private sale, it shall have been otherwise stipulated and agreed in writing between the vendor and the purchaser.

45. (1) No person shall expose for sale or sell at any public auction or at any public market any inoculated cattle unless the same shall have been inoculated not less than sixty days previously to the day of sale; and if any person who shall purchase any such cattle at any such sale shall prove that the same have been inoculated within sixty days of such purchase he shall be entitled to annul the sale, and to sue the vendor for restitution of the price paid for such cattle and for all loss or damage which the purchaser may sustain in the event of such cattle communicating lung-sickness to other cattle.

(2) The vendor of any inoculated cattle sold in any private sale shall be deemed to have warranted that the same have not been inoculated within sixty days of the date of sale, and if the purchaser shall prove that such cattle have been so inoculated within such period of sixty days, he shall be entitled to annul the sale, and to recover such purchase money as may have been paid, and, if it shall be proved that the vendor was aware, or had sufficient opportunity to be aware that such cattle had been inoculated within a period of sixty days of the date of sale, such vendor shall in addition be liable to make good all loss and damage which the purchaser may sustain in the event of such cattle communicating lung-sickness to other cattle; provided that such warranty may be waived or modified by agreement in writing between the vendor and purchaser.

46. Unless the purchaser when suing for damages shall prove that he took precaution to prevent the spread of lung-sickness amongst his herd as soon as he saw any symptoms that such disease had broken out among the cattle purchased, he shall not be entitled to recover damages, as in the preceding section mentioned.

47. (1) No action for the restitution of the purchase price of any cattle purchased, which may have shewn symptoms of lung-sickness, or for damages caused by such cattle communicating the disease, shall be maintainable under the provisions of this Ordinance, unless

(a) within seven days of the first symptoms of lung-sickness having been seen in the said cattle by the purchaser or any of his servants, the said cattle shall have been examined by an Inspector, Sub-Inspector, or duly appointed officer, or by two witnesses; and

(b) notice that such symptoms have been seen has been within such period served on the vendor if resident within twenty miles of the purchaser, or if resident more than twenty miles distant despatched to him by post.

(2) The Court, when awarding damages, shall take into consideration all reasonable expenses which may have been incurred by the purchaser in connection with such purchased cattle.

48. On it appearing to any Poundmaster that any animal is suffering from lung-sickness, he shall act in accordance with the provisions of Sub-Sections (2), (3), (4), (5), (6) and (7) of Section 38 of this Ordinance.

49. Any Poundmaster who shall sell any cattle at a Pound where lung-sickness has occurred within six months previous to the date of such sale, shall at the time of sale first publicly declare at what date the last case of lung-sickness occurred in the Pound.

50. Every Poundmaster shall keep a book for the purpose of entering therein a record of each such case of lung sickness shewing the date when the animal was destroyed, and stating whether on examination the Poundmaster and the witness or witnesses pronounced the animal to be infected with lung sickness, and recording the marks by which such animal was to be distinguished; and such book shall be received in evidence if any question arises concerning the destruction of any animal under the provisions of this Ordinance or compensation in respect thereof.

51. A Poundmaster who shall fail to comply with any of the provisions of the last three preceding sections shall be liable to a fine of Five Pounds, or to fourteen days' imprisonment with or without hard labour in default of payment.

PART V.

GLANDERS.

52. For the purpose of this part of the Ordinance all qualified Government Veterinary Surgeons shall, in the absence of an Inspector or Sub-Inspector appointed under this Ordinance, have the powers given to Inspectors under this Ordinance.

53. Whenever any notice or information shall have been received by any Inspector or Sub-Inspector, or it shall otherwise have come to the knowledge of any such Inspector or Sub-Inspector, or he shall have reason to suspect that any animal in the area for which he is appointed is infected with glanders, he shall, with all convenient speed proceed to inspect such animal, and if he consider it necessary, subject such animal to suitable tests, in order to discover whether such animal is infected with such disease in a visible or latent form.

54. The decision of such Inspector or Sub-Inspector that any animal is infected with glanders, or that it is liable from contact or otherwise to develop the disease, shall be held conclusive evidence of these facts, under this part of this Ordinance, and shall be held to authorise and justify any steps which such Inspector or Sub-Inspector may take, or direct to be taken, in dealing with the animals infected.

55. No compensation shall be payable by the British South Africa Company for any animal destroyed by any Inspector or Sub-Inspector, because found by him to be infected with glanders.

56. Any person who shall find any animal infected, or suspected of being infected, with glanders, and not in charge of any person, in or upon a public or private road, street or thoroughfare, or on any common land or outspan place, or running loose upon the place or ground of any person, may secure such animal on the spot, if practicable, or, otherwise, at the nearest place deemed more suitable by such person, until it can be examined, as provided by this Ordinance.

57. The keeper of any accommodation-house or hotel, who shall

- (1) knowingly stable, or permit the stabling of any animal which shall be infected with glanders, or be suspected of being so infected; or
- (2) after having stabled such animal, discover that it is so infected, and shall neglect properly to clean and purify such stable, and any manger, harness, or furniture therein, according to rules framed and published by the Administrator; or
- (3) stable any animal of any visitor in a stable or other building in which an animal infected with glanders has

been stabled, without previously purifying such stable or buildings, and any manger, harness, or furniture therein, as aforesaid,

shall, upon conviction, be liable to a penalty not exceeding Twenty Pounds, or in default of payment to imprisonment, with or without hard labour, for a period not exceeding one month.

58. (1) All clothing, utensils, or other articles, which, in the opinion of a qualified Veterinary Surgeon, or other person duly authorised by the Administrator, are likely to disseminate glanders, shall, without compensation, be destroyed or otherwise dealt with as directed by the person aforesaid.

(2) The said Veterinary Surgeon, or duly authorised person, may require the purification, to his satisfaction, of any vehicle, building or place, where a diseased animal has been kept.

PART VI.

RABIES.

59. (1) The Administrator may, whenever it shall be shewn to him to be expedient so to do, declare, by notice in the "Gazettee," any district in Southern Rhodesia, or any portion of such district, to be an area coming under the operation of this part of this Ordinance.

(2) The Administrator may, in and by such notice, issue rules and regulations, to be in force and effect in the area so declared as aforesaid, for preventing the spread of the disease known as rabies, and may from time to time repeal, alter and amend any such notice, rule, or regulation.

60. The rules and regulations, issued by virtue of the last preceding section, may provide *inter alia* for all or any of the following matters:—

- (1) The appointment, control and duties of officers for carrying out the provisions of this part of this Ordinance.
- [2] The mode of destruction of all animals whose destruction may be necessary under this part of this Ordinance, and the disposition of the carcasses of animals so destroyed.
- [3] The removal of any animals from, and their introduction into such area.
- [4] The muzzling, control, detention, isolation, or custody of dogs or other animals which it shall not be necessary to destroy.
- [5] Generally for carrying out the provisions of this part of this Ordinance and preventing the spread of rabies.

61. Whenever in any Municipality, Town, or Village, there shall be in force any local bye-laws, rules or regulations regarding the muzzling or destruction of dogs, the Administrator may, by notice in the *Gazette*, suspend the operation of such bye-laws, rules or regulations for the period during which rules and regulations under this part of this Ordinance shall be in force in such Municipality, Town or Village, but such suspension shall not affect anything done or any proceedings pending under the suspended bye-laws, rules, or regulations at the time of the publication of the said notice in the *Gazette*.

62. The word "dog" shall for the purposes of this Ordinance be taken to include female as well as male dogs, and shall also include any other animal subject to the disease known as rabies, which the Administrator may specify under any rules and regulations issued under this Ordinance,

PART VII.

MISCELLANEOUS.

63. Proceedings for contravening any section of this Ordinance, or any rules or regulations promulgated in terms of this Ordinance may be taken before the Court of the Magistrate of the district where the offence is committed, provided that no Magistrate shall inflict a greater punishment than a fine of Twenty Pounds or Three Months' Imprisonment with or without hard labour in default of payment of any fine inflicted.

64. All fines under this Ordinance shall be paid to the British South Africa Company in its local Treasury; provided that in any case the Court may direct and award payment of any portion not exceeding one half of the fine recovered to any person or persons not being an official of the Administration who may have given such information as may have led to the conviction of the offender.

65. This Ordinance may be cited for all purposes as the "Animals Diseases Consolidation Ordinance, 1904."

THE FIRST SCHEDULE.

LAWS REPEALED.

No. and Year.	Description or Title.
5th January, 1899	Proclamation by His Excellency Sir William Francis Butler, K.C.B., Acting High Commissioner, for the suppression of Glanders.
Ordinance No. 5, 1900	"The Lung sickness Ordinance, 1900."
Ordinance No. 7, 1901	"The Animals Diseases Ordinance, 1901."
Ordinance No. 11, 1903	"The Animals Diseases Ordinance, 1903."
1st September, 1902	Proclamation by His Excellency Lord Milner, High Commissioner, declaring Act No. 3 of 1893, of the Cape Colony, known as the "Rabies Act, 1893," in force throughout Southern Rhodesia, with certain corrections therein mentioned.

THE SECOND SCHEDULE.

SCAB LICENCE.

No.

Mr. resident at
 in the District of is hereby
 permitted for the term of six weeks from this date to retain at
 the following number of
 sheep and goats—(sheep goats) infected
 with Scab, which animals he is hereby directed to cleanse from Scab and
 not to remove from said place.

Scab Inspector,

.....19.....

THE THIRD SCHEDULE.

PERMIT.

Mr.....resident at.....
 in the District of.....is hereby
 permitted within.....days from this date to remove
 from.....to.....
 the following number of sheep and goats:—
 Sheep..... Goats.....

.....
 Scab-Inspector,

..19.....

Ordinance No. 2, 1910.]

[Promulgated 1st July, 1910.

AN ORDINANCE to amend the "Animals Diseases Consolidation Ordinance, 1904."

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. The definition of "animal," as contained in Sub-section [1] of Section 3 of the "Animals Diseases Consolidation Ordinance, 1904," shall include poultry as hereinafter defined, and the provisions of the said Ordinance shall extend and apply to such poultry.

2. "Poultry" means domestic fowls, ducks, turkeys, geese, pigeons, pea-fowl and domesticated guinea fowl.

3. This Ordinance may be cited for all purposes as the "Animals Diseases Amendment Ordinance, 1910."

Ordinance No. 10, 1910.]

[Promulgated 5th August, 1910.

AN ORDINANCE to compensate the owners of stock destroyed or injured by trains on railways in Southern Rhodesia.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. Every individual, partnership or company owning or working any railway in this Territory shall be and is hereby obliged to make compensation to and indemnify the owner of any stock destroyed or injured by any train running by daylight on any line of railway owned or worked by such individual, partnership or company if the part of the line at which such destruction or injury takes place is not properly and securely fenced; provided that such destruction or injury was not due to the gross negligence or wilful act or default of the owner or his servants.

2. No person shall be entitled to recover any sum of money under this Ordinance who shall fail, within seventy-two hours after such stock shall have been destroyed or injured, to give notice to the nearest station master or other responsible railway official of the injury or destruction thereof, and of the number and kind of stock so destroyed or injured, in respect of which compensation is claimed; and the carcasses or remains of all destroyed stock, and all injured stock, in respect of which any claim is made under this Ordinance for compensation or indemnification shall be diligently and to the best of his ability kept and preserved by the owner making such claim for a period of not less than four full days from

the time when such destruction or injury took place, and shall be shewn to any person appointed for the purpose of ascertaining the value of the stock so destroyed or injured.

3. No person shall fail diligently and to the best of his ability to keep and preserve such carcasses or remains of destroyed stock, or such injured stock as aforesaid, or who shall make any claim for compensation under this Ordinance which any Court shall determine to be made with intent to defraud, shall be entitled to any of the benefits of this Ordinance; and any person who shall make such claim with intent to defraud shall be liable on conviction to all the penalties of the crime of fraud.

4. If there shall be a dispute merely as to the value of the stock destroyed or injured, such dispute shall be referred to the Magistrate or Assistant Magistrate of the district in which the destruction or injury of the stock occurred, and such Magistrate or Assistant Magistrate, on being satisfied that due notice has been given to all parties, shall proceed, without the filing of any process or pleadings, and in as expeditious and inexpensive a manner as possible, to the determination of the amount of compensation to be paid, and may make such orders as to the payment by either party of the expenses necessarily incurred as to him shall seem proper.

5. "Stock" shall include horse, gelding, mare, colt, filly, mule, ass, bull, ox, cow, calf, sheep, goat, ostrich.

6. The amount of the compensation payable under this Ordinance shall in no case exceed the following rates:—

For any horse, gelding, mare, colt or filly	£50	0	0
For any mule	30	0	0
For any ass or ostrich	10	0	0
For any neat cattle, per head	20	0	0
For any sheep or goat	1	10	0

7. This Ordinance may be cited as the "Railways Injuries Compensation Ordinance, 1910."

Government Notices.

No. 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswillamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection

with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of

Melsetter and Untali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Untali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Untali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Untali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roads distant, bounded north-westwards by a line about 1,350 roads in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roads in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALL.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to Station

will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; farther, that such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....
Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION 1, GOV- ERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
 Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be
 true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals
 Diseases Consolidation Ordinance, 1904," I do hereby cancel and
 repeal Government Notice No. 124 of 1908, and do hereby declare and
 make known that, notwithstanding anything to the contrary elsewhere
 provided, the importation of cattle for bona fide slaughter purposes may
 be permitted into the Untali district from the adjoining Portuguese ter-
 ritory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of
 these regulations, shall be under the absolute control and direc-

tion of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

- (2) The importation shall be by rail only, and all cattle shall be trucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 268 of 1907]

[26th December, 1907

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.
2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.
3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.
4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

No. 216 of 1909]

[23rd September, 1909]

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND
AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

- (a) on permission granted by an inspector or sub-inspector or other officer authorised by the Administrator;
- (b) within the boundaries of any single farm where such cattle are depastured;
- (c) within any area enclosed by a substantial fence;
- (d) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;
- (e) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

- (a) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commissioners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (c) of the said Section;
- (b) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;
- (c) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;
- (d) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (b) hereof, shall be immediately thoroughly dipped or sprayed;
- (e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter.

and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

- (f) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

- (a) within the borders of the following native districts:—Gwelo, Hartley, Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;
- (b) within the following groups of native districts:—
 - (1) Charter and Chilimanzi;
 - (2) Mtoko, Mrewa, Makoni and Inyanga;
 - (3) Goromonzi, Mazoe and Darwin;
 - (4) Chilimanzi, Victoria, Ndanga and Chibi;
- (c) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All yeld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	...	...	3d. per head.
For horses and mules	...	...	3d. "
For calves (under 6 months) and donkeys	...	...	2d. "
For small stock	...	...	1½d. "

with a minimum charge of 6d. or any number of animals not aggregating such fee under the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried out with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle Inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

No. 356 of 1908]

[19th November, 1908

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

No. 39 of 1909]

[11th March, 1909

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. **U**NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

- (b) within the boundaries of any single farm where such cattle are depastured;
- (c) within an area of land enclosed by a substantial fence;
- (d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

- (a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;
- (b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;
- (c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;
- (d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;
- (e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Vete-

riary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

7. All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d. per head.
„ Horses and Mules	3d. „
„ Calves (six months and under)	2d. „
„ Small Stock	½d. „

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 224, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not

exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Velt in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two

miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any

second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the pro-

visions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. **O**N and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziecte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls "	0	5	0
d. " donkeys "	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable

time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 281 of 1909]

[2nd December, 1909]

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:—

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

No. 309 of 1909]

[30th December, 1909]

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil., is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 253 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 sub-section 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 10 of 1910]

[27th January, 1910.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of hides of every description from North-Western Rhodesia and Portuguese East Africa. I do further declare, in terms of section 5, sub-section (6) (a), that any hides introduced in contravention of this prohibition shall be confiscated and destroyed.

Any person contravening the provisions of this Notice shall, upon conviction, be subject to the penalties prescribed by the aforesaid Ordinance.

No. 128 of 1910]

[9th June, 1910

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 10 of 1910, in respect of the prohibition of importation of hides from North-Western Rhodesia.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the

native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODERIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
- b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

[2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.

Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....

Government Veterinary Surgeon
(or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

3. CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....

Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 168 of 1910.]

[30th June, 1910.

MOVEMENT OF CATTLE: MAZOE, GOROMONZI,
MARANDELLAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the regulations promulgated by Government Notice No. 68 of 1910, and so much of Government Notice No. 216 of 1909 as may be repugnant to or inconsistent with the subjoined regulations, and make the following provisions in lieu thereof:—

1. The movement of all cattle is hereby prohibited within the following areas:—

[1] The native district of Mazoe south of a line drawn from the northernmost beacon of Moore's grant to the north-east beacon, and thence to the south-east beacon of that estate; thence to the eastern beacon of the Howick Estate; thence to the eastern beacon and to the southern beacon of Burley Bottom, and thence to the south-western beacon of Belford Estate No. 2; thence following the western and southern boundary of Belford Estate to the westernmost beacon of Springvale; thence following the southern boundary of Springvale and Great B, and the eastern boundary of the latter farm to

the southernmost beacon of Arnold's; thence in a line eastwards to the western beacon of Pote, and thence along the northern boundary of that farm to the Poorti River.

[2] The native district of Goromonzi south of a line drawn from the north-west beacon of Bonny along the western boundaries of that farm and the Vale to the south-west beacon of the latter and from that point along the northern boundary of the Msana Reserve to the Inyagui River.

[3] The commonage of Salisbury.

[4] The following area partly within each of the native districts of Goromonzi and Marandellas from the south-west beacon of Roraima along the western boundary of this farm to the south-west beacon of Essexdale, thence to its north-west beacon, thence to the north-east beacon of that farm, thence along the north-west boundary of the farm Shortlands, thence along the western boundary of Loquat Grove to its north-west beacon, thence up the Inyagui River to the north beacon of Cotter, thence to its eastern beacon, thence to the north-west beacon of March, thence along the north-eastern boundaries of the farms March, Bovey Tracey, and Mangwendi Mission, thence from the north-eastern beacon of the last-named along the north-eastern boundary of the farms Gatzi and Allen, thence along the eastern boundaries of Ta ra ra, Boom, De ay, thence along the southern boundaries of De ay, Alexandra, Waltondale, Dudley Estate, and thence along the western boundary of Dudley Estate to its north-western beacon, thence along the southern and western boundaries of the Lendy Estate to its north-western beacon and thence to the southern boundary of Roraima to the first-named point,

save and except—

- a. on permission granted by an Inspector or Sub-Inspector or other officer authorised by the Administrator;
- b. with the boundaries of any single farm where such cattle are depastured;
- c. for cattle, the property of natives, within a radius of four miles of their owner's kraal, situated within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof.

2. The following movements of cattle may be permitted within the above-mentioned areas under the written authority of an official thereto duly authorised and subject to such conditions as it may be deemed expedient to prescribe—

- a. slaughter cattle to centres of consumption;
- b. cattle for mining and farming purposes, including oxen required for ploughing, cattle required for breeding or dairying and grazing, but the latter only where shortage of pasturage or water is proved to exist;
- c. cattle detained *en route* under Government Notice No. 68 of 1910;
- d. transport cattle solely for the purpose of wood riding to one mine or group of mines and within such limits as may be endorsed on the permit, and for the purposes of the sanitary service only within the commonage of Salisbury, exclusive of that portion defined in section 3 b.

3. No cattle shall be permitted to enter or leave the under-mentioned areas:—

- a. the farms Gletwyn, Stamford, and Plot 50, Avondale, in the native district of Goromonzi;
- b. that portion of the commonage of Salisbury bounded by the railway from the point where it enters the commonage on the west side of the Hillside crossing, thence along the fence on the banks of the Makabusi River and up that river to its junction with the eastern boundary of the commonage and thence following the boundary in a westerly direction to the point first named;

- c. the farms Bitton and Syston, both situated in the native districts of Mazoe and Goromonzi;
- d. the fenced area of Marandellas, including the farms Rockery, Progress, Longlands, Revolt, Rakodzi, Springvale, Retreat, Uplands, Glensomers, Elmswood, Rusawi Outspan, and a portion of Lottie.
4. The removal of the following articles from the areas mentioned in 3 is prohibited, save and except with the permission, in writing, of the Chief Veterinary Surgeon:—
- Green forage, hay of any sort, fodder, bedding, reeds, manure, or any other article which may reasonably be supposed to convey infection.
5. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect to each offence, to the fines and punishments prescribed by the Ordinance; and in cases where no special punishment is provided, to a fine not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

No. 245 of 1910.]

[8th September, 1910.]

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (c) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazeley	Thornvlei

No. 211 of 1910.]

[4th August, 1910.]

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.
2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.
3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—
 - (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
 - (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.
4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.
5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or

without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 202 of 1910]

[28th July, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibitions contained in Government Notices Nos. 142 and 168 of 1910 and in any Regulations in force at the date of this Notice, the removal of cattle which it is considered desirable to remove or isolate from any area may be directed by the Chief Veterinary Surgeon under such conditions as it may be deemed expedient by him to prescribe.

No. 229 of 1910]

[17th August, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

[18th August, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 252 of 1910.]

[22nd September, 1910.]

EXPORT OF CATTLE TO BRITISH EAST AFRICA.

IT is hereby notified for general information that a Proclamation has been issued by His Excellency the Governor of British East Africa prohibiting the importation into that territory of cattle from the several provinces comprising the Union of South Africa and from Rhodesia.

No. 254 of 1910.]

[22nd September, 1910.]

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaguabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Alphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 240 of 1910.]

[1st September, 1910.]

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederae*)
- The Circular Purple Scale (*C. aonidum*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beckii*)
- The Long Scale (*L. gloveri*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 258 of 1910.]

[29th September, 1910.]

UNDER and by virtue of the powers conferred on me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purposes of the said Ordinance, and in terms of section 4 thereof bring the provisions of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native district of Bulalima-Mangwe within the following boundaries:—

From the easternmost beacon of farm Highfield along its eastern boundary, thence along the north-east boundaries of farms Holmwood and Wesleyan Mission Station to the point where the latter boundary intersects the Tegwani River, thence down the Tegwani River to the point where it intersects the Bechuanaland Protectorate border, thence along the Bechuanaland Protectorate border in a southerly and easterly direction to the south-west beacon of the farm Dryden, thence along the southern and eastern boundaries of farm Dryden to the northern beacon of farm Luscombe, thence along the southern and eastern boundaries of Plum-tree outspan to the point where the railway line enters the outspan, thence along the north side of the railway line to the easternmost beacon of farm Highfield.

Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

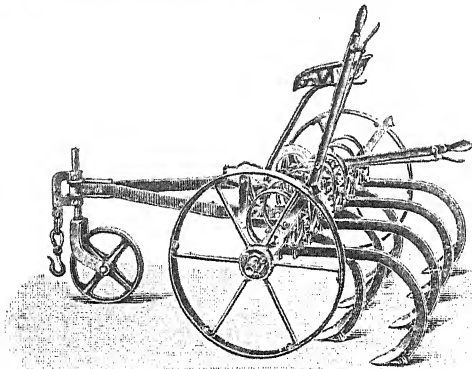
The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

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South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stock should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings,
BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.



THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY

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Editorial.

AFRICAN COAST FEVER.—The report of the Committee of Enquiry in respect of African Coast Fever has received the earnest attention of the Government, and its recommendations are being put into force with as little delay as possible. This will be done partly by means of the issue of new regulations governing the movement of cattle under powers contained in existing laws, and partly by the introduction of amending legislation during the next session of Council. The recommendations, although not of a revolutionary character, are far reaching in their effects, and entail changes of procedure which will in some measure affect farmers and transport riders.

Certain fundamental changes have been recommended, and steps will be taken to put these into force. Of these the first is the limitation of the area over which movement of ox-transport will be allowed. The Committee's proposal is that farmers, miners and others in clean areas shall be afforded access to the most convenient station or siding, and that this outlet shall be fixed, with the object of avoiding the danger of the concentration of cattle from different parts of the Country at any one centre.

A second recommendation of prime importance is that for the prevention of the movement of tick-infested cattle. In place of certificates of dipping or stipulations regarding spraying, the actual state of the cattle as regards infestation by ticks will be a condition of their movement, and will form an effective check to the spread of tick borne disease. This principal entails radical alteration of the procedure in issuing permits, and the supervision of dipping. The Government has decided to abolish dipping fees; certain public dipping tanks will be provided in which cattle may be dipped without charge. Regular periodic dipping will be enforced for mutual protection of owners in the case of cattle running on a public grazing ground such as the commonage of any township.

Strong recommendations with regard to fencing are made by the Committee, and these are receiving attention in connection with legislation which will be brought forward after further deliberation at the next ordinary session of the Council. A number of the recommendations entail amendment to the Animals Diseases Consolidation Ordinance.

The proposal to extend the loans granted for the purchase of fencing material beyond the present limit of £200 is approved.

Another proposal of the Committee is to render compulsory the reporting of all deaths within a fixed radius of any centre of contagious disease, and the enumeration of all stock within such areas. This will be put into effect.

The numbers and constitution of the staff at the disposal of the Chief Veterinary Surgeon have been carefully reconsidered. It has been decided to strengthen the central staff by the addition of a Veterinary Inspector, and to increase the number of Government Veterinary Surgeons by four, and to have additional centres at which Government Veterinary Officers will be stationed. Arrangements in this connection are still under consideration. It is further proposed to appoint six additional Cattle Inspectors to the substantive strength of the Department. Several other matters are also receiving attention, including the compulsory marking of vehicles with the names and addresses of the owners, the stoppage of all transport throughout Umtali and Melsetter Districts if a two-thirds majority favours such a course, measures for quarantine of stock, increases in the number of public dipping tanks, and the experimental use of portable spraying tanks.

THE INTER-COLONIAL AGRICULTURAL UNION.—The sixth annual Congress of the Inter-Colonial Union of South Africa met during November at Capetown; Rhodesia was represented by Messrs. R. A. Fletcher, M.L.C., H. O. Backhouse, F. Eyles, C. B. Gwynne and C. S. Jobling.

This Congress is the most important of the several agricultural conferences which meet as "agricultural parliaments" throughout the year, and is representative of the most influential interests in South African farming matters. Strictly non-party; it is only political in the best sense of the word, in that it aims at and in effect does, guide the policy of agricultural progress.

His Excellency the Governor-General of South Africa, Lord Gladstone, opened the proceedings. The question of Coast Fever figured largely on the Agenda and was ultimately referred to a committee which drafted a series of recommendations with regard to measures of eradication, and this, after general discussion, became the finding of the Congress. Scab, epizootic lymphangitis, cattle cleansing, control of export and import of live stock all received attention; questions relating to breeding stock, poultry, to railway rates, to inspection and grading of products exported, fruit transport, forestry, veld burning, labour, immigration, were dealt with; and Agricultural Departments, colleges and experimental farms considered; indeed, the whole gamut of rural problems was raised in one form or another.

A marked discretion, borne of an increasing sense of the responsibility associated with such deliberations, characterised the tone of the proceedings, lending in turn weight to the discussions and a degree of authority to its conclusions which assured them widespread attention by the public and earnest consideration by all interested.

FORESTRY.—Recently, in compliance with the request of the Administration of Rhodesia, the Union Government kindly permitted Mr. J. Sim, a forest officer of experience, to visit Rhodesia. After a four months exploratory tour, in which types of the various classes of natural forests were visited, and the endeavours to establish plantations seen, Mr. Sim has furnished a detailed report and made recommendations with regard to the future. These are now receiving the

consideration of the Government, and the descriptive portions will be published in this Journal by instalments.

The problems Mr. Sim was called upon to consider are momentous and complicated. Not only have immediate needs and present conditions to be considered, but also the requirements of the future. Wood is so essential, so irreplaceable by substitutes, and takes so long to produce, that the problem of provision for a distant future has to be considered now—should indeed have been taken up years ago.

Regarding the use of wood there appear to be two extreme views, and truth probably lies mid-way. Some consider the removal of native timber, even of scrub in the bush-veld, as of the nature of sacrilege, to be followed ere long by a change in our climate, a conversion of our veld into karroo, our rivers into ravines, and our vleis into arid wilderness. Others, again, regard all trees as adjuncts of mining and prospecting, to be taken whenever wanted, without regard to waste involved or of the future needs of the community, or of regeneration of the areas devastated.

Our forests must be exploited to furnish our requirements for mining and other purposes. At the same time they must be conserved with a view to maintaining the supplies through all time, to provide our needs without drawing on the capital, and to increase and improve and cheapen the supply of timber, while safeguarding those other interests of a climatic and hydrographic nature which are of national importance and which remain for all time.

These ends can only be achieved by systematic conservation and control and by adopting silvicultural methods in place of the present ruthless, haphazard and wasteful ways. The recommendations made by Mr. Sim to this end will receive the most earnest consideration.

FENCING LOANS.—A further concession of importance has been made in connection with the loans granted to farmers to enable them to purchase fencing material. The limit hitherto fixed has been withdrawn and grants above £200 may now be made to applicants furnishing adequate security.

Fencing loans are given both for internal and boundary fences to farmers furnishing adequate security, personal surities of standing, or mortgage on property. The advance

is only made at the discretion of the Fencing Loans Committee after due enquiry and on production of firm quotations for the material required, and after the fence has been erected and inspected. These conditions present no difficulty to the average farmer and remove any excuse he may have for not safeguarding himself against the possible advent of disease amongst his cattle.

MAIZE PRODUCTION.—We would call special attention to the article by Mr. Mundy dealing with ways and means of reducing the cost of the production of mealies. Two great problems present themselves to the arable farmer of Rhodesia; firstly, how to make the most profit out of our chief existing staple industry; and second, how to add to the number of payable crops that can be grown.

The market price of mealies is fast approaching the limits fixed by the world's supply and demand, and the days of local fancy prices are definitely over. The margin of profit is narrowed and the share of grain that falls to the grower has now to be obtained, not from the consumer, but from Nature, by cheapening as far as possible the cost of production, by effecting every possible economy in labour and utilising every means known to science and to practise of increasing the yield and improving the quality. These matters are largely in our hands and within the region of common knowledge, obtainable if not already possessed by the farmers concerned.

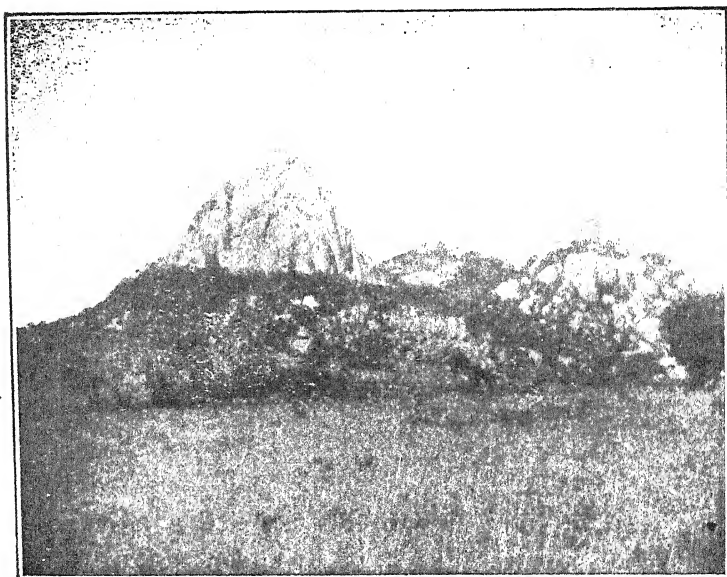
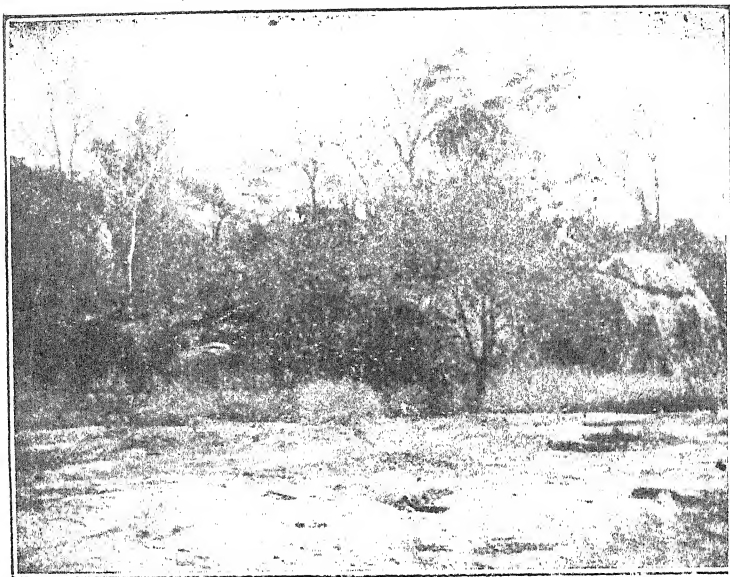
NEW CROPS.—The second problem—that of alternative crops to mealies—affords a wide field of enquiry. The solution is not likely to be in any one single item, but rather in a number of plants suited to different localities and for different purposes. Farmers are apt to be over anxious to grow crops to sell direct, such as mealies, tobacco, potatoes, forage and veld hay, instead of providing food to be turned into some concentrated form before leaving the farm, thus turning over the capital and earning double profits. No one crop is likely to be so accommodating as mealies, adapting itself so readily to many soils and to considerable variations of climate, yet there are a number of crops deserving more

general attention than they receive, or at least deserving widespread trial. Seed of these is being issued to those prepared to make trial of them, for particulars of which readers are referred to our Departmental Notes.

TRESPASS.—In connection with permits granted for the movement of cattle, it appears that not infrequently those in charge of the stock deem such a permit to give them power to travel to their destination by any route they desire, and to traverse intervening land regardless either of roads or of the rights of others. It would be well that these misconceptions should be removed and that persons engaged in moving stock should adhere strictly to the letter of their permits and realise that permission to move stock does not constitute a right to trespass.

TWO NEW FARMERS' ASSOCIATIONS.—Again we have pleasure in announcing the formation of new Farmers' Associations, one at each extremity of the territory—at Marula with Mr. Ingram as secretary, and in North Umtali, the secretary being Mr. R. O. H. Blurton Jerain, Private Bag, Umtali. The spread of such organisations cannot but benefit the whole farming industry of Rhodesia.

TO FARMERS.—We would ask farmers when writing to the Department of Agriculture for information, to be careful to give adequate addresses in order to insure receipt of replies. Particularly is this necessary in the case of subscribers to the *Journal*, who too often give a post office or a postal box as an address, whence we often receive a number of copies after a time, "unclaimed," often followed by indignant letters from the addressee regarding non-receipt. In cases where visits by the Engineer or the Agriculturist are sought, and these are frequent, it is further desirable that the situation and mode of reaching the farm should be indicated, in order to assist in the planning of tours so as to economise time and to be a guide in travelling. Besides the name of the farm of the farm and district it is therefore desirable in such cases to indicate the nearest town, station or centre, and approximately the distance and direction,



Forest on rocky slopes, protected thereby from fire.

(1) Makoni district.

(2) Odzi, Umtali district.

Extracts from a Report on Forestry in Southern Rhodesia.

By JAMES SIM, F.H.A.S.,
Forest Department, Union of South Africa.

Before proceeding to describe the forests of the country, it would not be out of place to point out the utility of forests from an economic standpoint.

Forests and Timber.—The chief economic purposes of a forest is to supply timber in quantity and kind to suit the requirements of the public.

The main timber supplies of the world are—it is stated by those best able to judge—nearing exhaustion, and the time is approaching when each country must either be in a position to supply itself from its own forests or pay the penalty in high prices. It is seldom found that any country—and more particularly tropical countries—have, in their indigenous forests, timber of a nature to suit all wants, as the trees are for the most part hardwoods, and it is a softer class of wood which is in demand. It is to supply this demand that the necessity for artificial forests or plantations arises, and the special use of the introduction of exotics is to meet this need, while the indigenous forests of the country should supply all that it is possible to extract from them without exhausting their resources.

Forests and Soils.—Forests tend to improve the soil on which they grow, by the formation of a layer of humus, from the annual fall of the leaf and the decay of all vegetable matter below them. Much of the plant food utilised by the trees and finally deposited as humus on the ground floor is drawn up from deep in the soil, and as the humus layer grows the surface soil is enriched. This humus layer, if retained and not consumed by fire, is very hygroscopic, making the whole soil more retentive of moisture and capable of carrying the best class of timber.

Forests also are most useful in fixing soil on steep slopes which would otherwise be washed away, or the soil cut up into dongas or sluits. On sandy soil they exercise the same protective faculty and prevent its being blown into sand drifts, as at Port Elizabeth, where the removal of the forest caused a drift which has cost over £60,000 to reclaim.

Forests and Wind.—The forests are the natural wind breaks of a country, and many instances could be given of arid land being made useful and able to carry crops when a shelter plantation had been planted, and more still of large areas being made desert when the protecting forests were destroyed. The removal of the forest has also frequently been the cause of sand drifts, and in a country where much of the soil is sandy, it is necessary to exercise great care in allowing the protective forest to be cut down. It is a costly matter to reclaim such land after sand movement does begin, and prevention is better than cure.

Forests and Climate.—It is a well known fact that forest air is damper than air in the open. That this is so has been proved by German and French scientists, who also state that the air in the forests is cooler by some 6 or 8 degrees at midday and warmer by 3 to 4 degrees at midnight, than air in the open. Extremes of temperature are therefore less.

Although within the tropics, the climate of Rhodesia—owing to its elevation—is only sub-tropical.

The temperature, although warm, is not excessive at any time, and extremes of temperature are not very great. In parts of the country frosts are almost unknown, while in others, such as the Matopos, Victoria and Inyanga they are fairly severe, a temperature of 20° being occasionally registered. The average relative humidity ranges from 52 per cent. at Salisbury, Empandeni and Plumtree, to 89 per cent. at Inyanga and 71 per cent. at Matopos. During the growing period, from November to April, it ranges at Salisbury from 58 per cent. to 71 per cent. and towards the end of the dry season falls as low as 35 per cent., while at Inyanga from November to April the range is from 85 per cent. to 97 per cent., and only falls as low as 72 per cent. towards the end of the dry season.

It will be observed that both the regions having a high percentage of relative humidity are mountainous, and it would be interesting to know if this is so in other ranges of hills.

The average rainfall of the country for four years is shewn in the accompanying Schedule—showing average Rainfall of stations of five years or more duration, including the year ended 31st December, 1909:—

Station.	Amount in inches.	No. of Days.	No. of years dur- ing which observa- tions have been re- corded.
MASHONALAND—			
Borrowdale ...	35.97	78	5
Charter ...	29.43	76	6
Chishawasha ...	38.08	91	9
Enkeldoorn ...	29.26	69	5
Gutu ...	27.53	70	5
Salisbury ...	32.74	87	12
Macheke ...	31.21	71	5
Marandellas ...	36.12	75	8
Melsetter ...	44.64	102	11
Mount Darwin ...	26.60	62	8
Mrewa ...	32.12	68	5
Public Gardens, S'tisb'ry	31.90	77	6
Rusapi ...	29.88	78	5
Sinoia ...	29.44	72	6
Sipolilo ...	23.77	63	5
Umtali ...	31.27	88	10
Utopia, Umtali ...	31.53	102	9
Victoria ...	25.71	60	11
Westridge, Salisbury ...	30.81	78	8
MATABELELAND—			
Bulawayo ...	23.82	79	12
Empandeni ...	23.29	50	10
Filabusi ...	22.75	56	6
Fort Rixon (Insiza) ...	20.21	61	5
Gwanda ...	20.30	60	5
Gwelo ...	25.28	77	9
Hope Fountain ...	26.67	79	12
Matopo Mission ...	24.19	68	5
Selukwe ...	39.98	79	6
Tegwani ...	21.06	50	8
Tuli ...	13.83	33	10

It will be seen at once that the rainfall for Mashonaland generally is considerably higher than that of Matabeleland.

Only two stations, Melsetter and Selukwe average 40ins. or over, but the former represents a fair part of the escarpment; while Gwanda with 19ins., and Tuli with 14ins., show the lowest rainfall in the country.

On the whole, the rainfall for most of Mashonaland is suitable for tree growth, while with the exception perhaps of Selukwe, great care would be necessary in selecting sites for plantations in Matabeleland.

The rainy season begins late in October or November and continues until March and sometimes April, and the rest of the year is practically dry except at such places as Melsetter and Inyanga, where winter rains are frequent. The greatest rainfall is usually in January or February, while August and September are the driest months.

The prevailing winds during the dry season are East and South-east, and during the rainy season East and North-east, the velocity being much greater at Bulawayo than at Salisbury; the mean for the year 1908 being: Salisbury 129 miles per diem and for Bulawayo 175 miles.

It is claimed by many that forests increase the rainfall, and very probably it is so. It is, however, a contentious question and very difficult to prove satisfactorily, and at the present day scientists are divided on the subject. It is, however, a significant fact that the forest regions of the Cape, Natal and other countries coincide with the regions of the heaviest rainfall. Part only of the rainfall of a forest ever reaches the ground, about one-fourth being retained by the tree tops and evaporated. That which reaches the ground does so gently, and sinking quietly into the soil is retained instead of rushing off as a torrent charged with soil, sand, etc.

Forests also regulate the frequency and intensity of the rainfall. Gentle rains from a humid atmosphere charged to its utmost capacity with moisture are more common, and torrential rain storms are less frequent. This is more important than the increase or otherwise of actual rainfall, 40ins. in storms doing less good than 30ins. of gentle rainfall.

It is necessary that records of rainfall and temperature be kept at such forest stations and plantations as may be established, and I would suggest that each forest station be also a properly appointed meteorological station.

Rocks and Soil.—The principal rock formations in this country are :—

- (1). Metamorphic rocks of schistose type, usually known as “formation.” This formation occurs in fairly extensive tracts, but is frequently broken up by granite kopjes.
- (2). Granite. This formation is very extensive, giving a poor sandy soil, difficult to break up. The granite areas are usually fairly well watered, while on the formation the lack of water is often felt severely.
- (3). Sandstone. A large area in the centre of the country is on sandstone, and the soil consists of a pinkish sand which is often of great depth, but poor, and would probably blow if exposed.
- (4). To the North of the Gorkwe, towards the Zambezi. This sand belt has to a great extent disappeared, or is mixed with shales and slates. The soil is very fertile and carries an entirely different flora.
- (5). A small area near the Eastern escarpment, shows a slight intrusion of dolomite, with a deep fertile soil.

The best tracts of trees in the country exist on the deep sandstone soil, comprising the teak forests on the Gwaai and Shangani, the Msasa forests at Ingandoma, and the Mopani and mixed forests at Wankie and Ingandoma, and on and around kopjes as at Hunyani, Mazoe, Odzi and Rusapi.

The deep sandy soil on the sandstone belt and the friable soil on the slopes of the kopjes which are almost always poor and not suitable for agricultural crops, carry the best crops of trees, while the soil in the valleys, whether deep or not, is usually rich and fertile, and although occasionally carrying fine big individual trees, can not be termed forest soil.

The trees develop a much more vigorous and extensive root system on the poor soil in order to get sufficient nutriment, and can stand much more prolonged droughts than those on the rich soil, which are sometimes waterlogged and sometimes cracked and dry.

GENERAL DESCRIPTION OF THE FORESTS.

As compared with similar areas in the Southern States now included in the Union of South Africa, Southern Rhodesia is well wooded. Cape Colony and Natal have, no doubt, very fine forests, but these are situated below the first escarpment, and are mostly on the mountain slopes facing the Indian Ocean, and within one hundred miles of the coast. The table land of Cape Colony is entirely destitute of trees, with the exception of some isolated patches, and taking Cape Colony as a whole, only about 1 per cent. of its area is forest clad. The Orange Free State is practically a treeless province, and the Transvaal, with the exception of its Northern and Eastern portion, is similarly without trees. Southern Rhodesia, on the other hand, is covered more or less thickly with trees over probably three-fourths of its entire area.

The forests, however, are with the exception of a few small and isolated patches on the Portuguese border, of a very different character to the dense evergreen forests of the Cape and Natal, and appear to resemble more closely the *Ruhks* of Northern India and the Central Plateaux of Mexico.

Much of the wooded country is covered with scrubby tree growth of little value, except for fuel and charcoal, and the best of the forests contain a very small amount of good marketable timber. The forests throughout are of an open character of the savannah type, and in large tracts are park-like, with individual trees or clumps dotted about on the grassy plains, and even where the trees are densest, the stocking is light and the forest bottom is covered with grass, with no humus layer or the usual forest undergrowth of ferns and forest weeds. The trees themselves, besides being sparse, are as a rule of small dimensions, and although many of them are of fair girth, are short boled with heavy spreading crowns, and of little commercial value. A large percentage of the trees have been damaged by veld fires which almost annually go through them, with the result that much of the timber when cut shows serious faults and blemishes, greatly reducing its value. There are, however, large tracts on which much useful timber is standing and which is well worth conserving, not only for the present value of the timber, but also for the potential value of the forests, which may in time, with rational and systematic management, be greatly improved.

The forests are of several very distinct types, and in order to give a fair description, it is necessary to refer to each of these classes separately. I have therefore classed them as follows, using the predominating species to distinguish each.

1. Msasa Forest.
2. Igusi or Teak Forests.
3. Mopani Forests.
4. Mashuma Forest.
5. Mohobohobo Forest.
6. Scrub Forest.
7. Mountain Forest.

INDIGENOUS TREES OF THE COUNTRY.

Botanically, the forests are interesting and peculiar, the outstanding feature being the large proportion of the order of Leguminosæ, not only in respect to number of species but also in the large areas over which they occur and the number of useful trees which belong to this order. With regard to the number of species, the genus *Acacia* is perhaps the most widely represented and contains several useful trees, but the most of them are of small size and without value. The *Brachystegias* are most widely distributed, and occur over a very large area. The natives recognise four species as distinct, and to these they have given the names: M'Sasa (*B. Randii*), M'Tondo (*B. sp.*), M'Bvuti (*B. appendicularis*), and Mountain *Acacia*, M'Busi (*B. sp.*), all of which grow into fairly big trees. Many other good timber trees of different genera belong to this order, and will be referred to in the accompanying list. The reason for the preponderance of this order is probably in part due to their power to endure the ever recurring veld fires, which although scorching the thick bark and blemishing the timber, do not, for a considerable time, kill the trees. Their deep root systems enable them to endure prolonged droughts, and the frequency with which the roots are covered with nodules of micro organisms is also not without good effect.

A few other orders are also well represented, such as *Combreteacæ*, *Euphorbiacæ*, and *Anacardiaceæ*. The most of the trees in these, however, have little economic value. A very large number of the trees are deciduous, although many of them retain their leaves during the greater part of the dry season and lose them as the buds are swelling for a

fresh leaf growth. Most of the trees when cut coppice freely and the coppice shoots are vigorous, very numerous and make dense bushes instead of trees, until at last one or two take the lead and the others gradually die back.

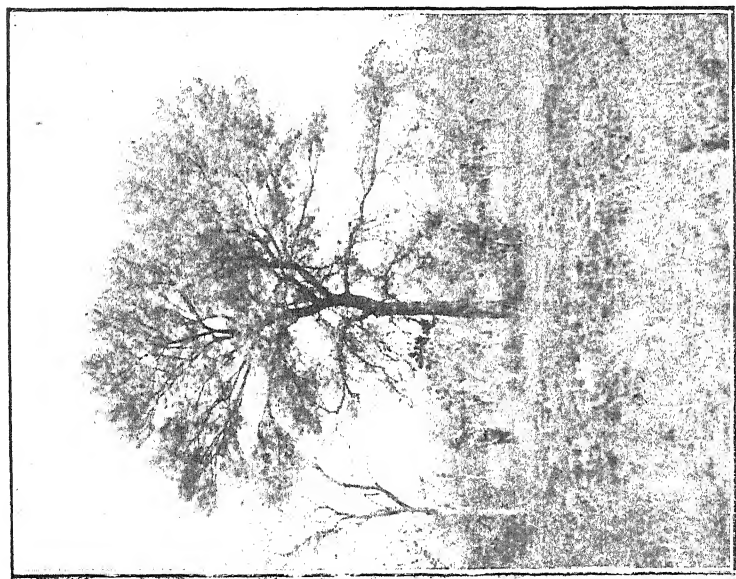
It is a very noticable fact that spring growth occurs nearly all over the country before the rains at the end of September or early in October, although this does not apply in some dry and late localities. The trees are mostly deep rooted and can obtain moisture from a considerable depth, and probably are able to retain a store of plant food in their buds and tissues for this early spring growth when everything around is parched and arid. The varied colours of the early leaves are very pleasing to the eye, accustomed to the dull grey of the dry season.

The trees of the mountain forests on the Portuguese border are unknown to me and the available material was insufficient for identification. They are, therefore, not included in the present list.

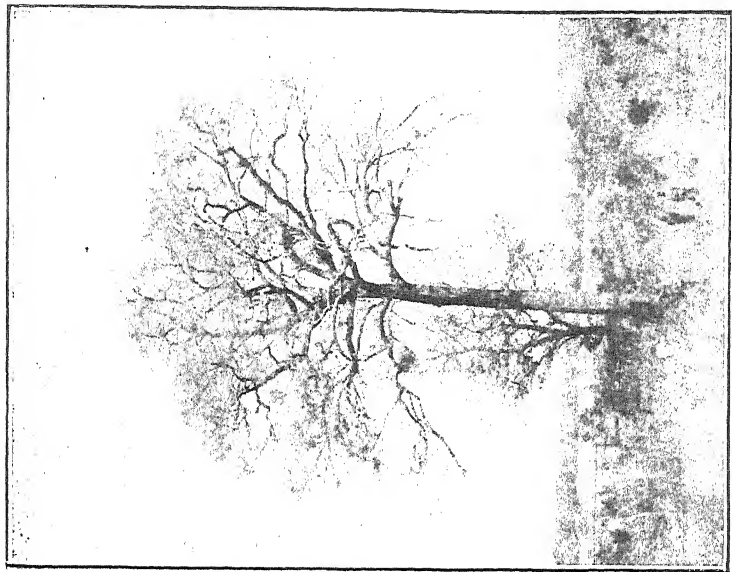
CONIFERAE. *Callitris Whiteii*.—The only indigenous conifer in Southern Rhodesia. It can scarcely be called a timber tree here, as it occurs only in patches on the Portuguese border as a gnarled shrub or small tree. It is very susceptible to veld fires, and if cultivated, seed should be obtained from the Forest Department, Nyasaland, where it makes fine timber. The timber is valuable, being borer and ant proof.

MORACEÆ. *Ficus sp.*—Figs are plentiful in numbers and in species, and occur in all parts of the country. Their chief value is as ornamental trees and shelter, and they might be utilized as fire breaks in plantations. The wood is soft and of little value; all the species yield latex, but it is doubtful if any will produce good rubber.

ROSACEÆ. *Parinarium mobolo*.—The mobolo occurs usually with M'sasa Forest in open glades, but is also found in very open Mopani scrub. It usually forms a fine tree with a straight, dark coloured bole and an umbrella-shaped crown of dark green foliage. It sometimes, as on the Somabula Flats, forms a scrub. The fruit is a small drupe which is edible. The timber is said to be excellent for buildings, wagons, etc., but is also reputed to take the edge off tools working it very quickly.



*Knobby-thorn tree (Acacia nigrescens) in
flower, not in leaf.*



Mashuma tree (Diospyrus mashuma)

Photinia. (Syn. *Eriobotrya mohobohobo*).—This almost ever-green tree is handsome with its stiff leaves and loquat-like fruit. It occurs sparsely in many places, forming only small trees, but in a few places it forms dense groves of fair sized trees. It has a light reddish timber which is very valuable as mining timber and for house building, being ant and borer proof. It is chiefly found on the gold belts, and should be worth cultivation.

LEGUMINOSAE. *Acacia albida*.—One of the largest trees of the country. The pods are broad and twisted, and are said to be nutritious for stock. Seen on the Gwaai River and on the river beds north of Inyoka. The timber is said to be good, being soft and easily worked. Natives make doors from it. Trees may be seen 60 feet high and 3 to 4 feet in diameter.

Acacia nigrescens.—One of the most valuable timber trees. It grows as isolated individuals or in groups, and frequently on formation soils. It is fairly common on almost all Mopani soils. The wood is borer and ant proof, has a straight grain and is considered to be strong, tough and durable. It is in great demand as a mining timber and is used also for wagon building, furniture and general carpentry where hardwood is required. It supplies baulks of timber 12 to 18 inches square and up to 20 or 25 feet long, but is frequently smaller.

Acacia sp.—A very large number of varieties of this genus occur, but their value is not known. Some grow into large trees while others are mere shrubs. They almost always appear as individuals or in small groups.

Copaifera mopani.—This tree shares with knobby thorn (*Acacia nigrescens*) the reputation of being the best mining timber in the country. Its heartwood, which is almost black, is very hard and ant and borer proof, being often used for timbering main shafts. It sometimes occurs of fair size with a diameter of 18 to 24 inches and a length of bole 18 to 20 feet, but it is much more common as a small tree or even as a shrub, with a very branching habit.

Copaifera coleosperma.—A large tree which grows in the teak forests and gives fairly good baulks of valuable timber, higher in weight and colour than teak, which it otherwise resembles. It is not very plentiful, but a valuable tree where it occurs.

Azelia cuanzensis. *Mahogany Bean*.—A very handsome tree up to 60 feet with a broad crown and heavy branches. The bole, although short, is usually straight. It flowers in October and the characteristic beans with their black and red colour take about two years to ripen. It is pretty generally distributed in the warmer parts of the country, and usually occurs on rocky kopjes where it is very conspicuous. The timber is of a lightish colour, with a slightly darker bark. It is fairly easy to work and takes a good polish. One of the most valuable trees of the country.

Bauhinia reticulata.—This is a small tree, only at times occurring of a useful size. Its thick, leathery leaves, divided in two are conspicuous. The timber is hard and is used for yokes. It frequently forms an undergrowth in high forests.

Cassia sp.—The Cassias have little economic value, but are distributed all over the country, and the pretty yellow flowers are conspicuous in spring. It is used as fuel.

Baikia plurijuga (Redwood).—One of the most valuable trees of the country. It is the principal timber tree in what is known as the teak forests of the Gwaai and Shangani rivers. It has a spreading habit of growth and branches low, having a short bole up to about 20ft. with a diameter of two to three feet. The timber is red, hard, durable and heavy, and useful for cabinet work, panneling, etc. Being ant and borer proof, it is useful both above and below ground. The timber is often damaged by internal blemishes. It reproduces readily from seeds and young trees coppice freely.

Melletia sp.—This tree I have been unable to identify with certainty. It closely resembles in leaf and timber the umzimbeet of the Transkei, although it does not appear to be identical. It occurs plentifully in Lomagundi and Mazoe and was also seen at Odzi, Penalonga and Que Que, being thus fairly widely distributed. It has a light grey, smooth bark, and the timber is so hard that in cutting firewood for the mines it is left standing. It is borer and ant proof, and is probably the best tree for standing in the ground in the country; being used for kraals, stands for mealie stores and for house building; useful for fencing poles where strength is required. Its diameter seldom exceeds twelve to fifteen inches.

Pterocarpus angolensis (Bloodwood).—This tree forms a nice straight bole up to 20 or 25 feet, but seldom more than 12 inches diameter. It gets its name from the fact that when tapped with an axe, its sap is red and resembles blood. The timber is hard and dark and is said to be used by the natives for yokes, hoe handles, etc. It makes a good mining prop. It is widely distributed all over the country, but the best trees are found on the sand belts with the teak. The flowers appear in October before the leaves, and during the dry season it is easily recognised by the peculiar disc-shaped pods with a bristling centre.

Pterocarpus sericeus.—A very common tree on the granite formation in the Matopos and elsewhere. It does not grow to a large size, but is used freely by natives in hut building.

Lonchocarpus capassa.—A fairly large tree with handsome panicles of mauve flowers, common all over the country. The timber is said to be soft and is used for house building.

Bolusanthus speciosus (Wild Wistaria).—A small tree which is common on formation and sometimes on granite. Its pendant blue flowers resemble Wistaria. Its timber is ant and borer proof and is very useful as it is one of the few trees which is durable enough for fencing or kraal posts. It never, however, gives poles of much size.

Erytherina tomentosa (Kafir boom).—A much smaller tree than the well known kaffir boom of Cape Colony (*E. Caffra*). It is used for brake blocks and makes a good live fence. Its handsome red flowers are conspicuous in Spring.

Brachystegia Randii.—The commonest tree in Mashonaland and is distributed all over the country, forming, with other brachystegias, nearly pure forest. Its timber is neither borer or ant proof, but is greatly improved by immersion in water. It is frequently a small tree, but in occasional tracts forms fine trees up to 60ft.

Brachystegia sp.—Very similar to the last and frequently mistaken for it. Although also perishable, the timber is harder and superior to M'sasa. Both are freely used in the mines as props, and the two timbers are not distinguished by miners.

B. appendicularis.—A large tree with a broad, spreading crown, usually found on kopjes where it is a conspicuous feature. It occurs on the ranges of hills all over the country. Its timber is red and is said to be durable.

Brachystegia sp..—A tall tree with spreading crown and a nice bole when well grown, but over large areas it is merely scrub. It is found with M'sasa nearly all over the country. The timber is whitish and of little value. Its bark, with that of the other brachystegias is used for fibre by the natives for tying and making baskets, etc. Brachystegia bark is very astringent and has been tested for tanning with, I am told, satisfactory results. It may therefore become valuable. All these trees when cut coppice very freely.

Burkea africana (Rhodesian ash).—Common all over the country and grows to be a fair sized tree. Said to be the best tree in the country for charcoal. The timber is red and I am told makes excellent wagon wood and is good for cabinet work.

Peltiphorum africana (Rhodesian wattle).—A very handsome tree when in flower, sometimes attaining a height of 50ft., but more usually from 20 to 30 feet. It is said the timber is sometimes used as wagon wood, and makes excellent fuel. In general appearance it resembles a wattle tree.

SIMARUBACEAE. *Kirkia accuminata*.—A fair-sized deciduous tree with branching habit but sometimes forming good boles. It is easily rooted and forms a good live fence. Usually found on granite kopjes. I saw timber of this tree at Inyoka where it was as easily worked and dressed as deal. It is therefore a soft wood.

MELIACEAE. *Trichilia emetica*.—A large handsome tree on the warmer valleys lying towards the Zambezi. The timber is said to resemble Mahogany. It is practically an evergreen, the flowers appearing frequently before the fall of the old leaves. The natives are said to eat the fruit.

EUPHORBIACEÆ.—This order is represented by several genera, some of which are said to be good trees. The genus Euphorbia is conspicuous with its erect branches. They all contain a latex, the value of which has not yet been ascertained. The timber is not valuable.

ANACARDIACEÆ. *Rhus lancea*, etc.—There are some ten or twelve varieties of this genus and they are widely distributed over the country. None, however, exceed about 20ft. and the timber has little value except as fuel and charcoal.

Sclerocarya caffra (Marula).—A very common deciduous tree which grows to a considerable size in many parts of the

country, but in others is only a shrub. Its timber is soft and natives make plates and spoons from it. It turns and dresses nicely. The fruit is about the size of an apricot and is said to be luscious.

RHAMNACEAE. *Zyphus mucronata* (Cat thorn).—A very thorny tree or shrub which grows in quantity in places. It sometimes grows into a tree and its timber is hard, borer and ant proof, and is said to make good wagon spokes.

BOMBACACEAE. *Adansonia digitata* (Baobab).—The biggest tree in Rhodesia. It is simply a monstrosity, with its huge trunk and pinkish green bark. It is quite soft and spongy and the timber is useless. The bark, however, can be removed without apparently hurting the tree. The natives take huge pieces for grain bins and from it a fibre is obtained which is made into clothes, rope, etc. The fruit is a large woody gourd with white pith, and from this a refreshing drink is made, hence the name—Cream of Tartar.

MYRTACEAE. *Eugenia cordata* (Water boom).—A fairly large tree at the Victoria Falls. It occurs frequently close to water courses. It is seldom that good baulks of timber can be got, but it is said to be very hard when dry. When newly cut however it can be worked easily. It is valuable in protecting springs. At the Grange farm, near Salisbury, several springs are protected by a fine grove of it.

COMBRETACEAE. *Combretum sp.*—There are some fourteen varieties of this genus, but most of them are small and useless. The largest is the one known as White Pear, which grows into a large handsome tree on formation soil. Another, known as Ironwood, found south of the Matopos, stands well in the ground as a post. Most of the species, however, are too small to have economic value, but might make good and effective hedge plants.

Terminalia sericea (Yellow wood).—This is one of the most useful small trees in the country. It seldom exceeds 10 to 12 inches in diameter with a nice straight bole of 15 to 20 feet. It is distributed over large areas of the country, but appears to avoid the schistose formation. The timber is yellow and soft when freshly cut, but hardens as it matures. The grain is straight and it takes a fine polish. It is borer and ant proof and is said to stand well in the ground. Two or three allied species occur, but are said to be of no value.

OLEACEAE. *Olea verrucosa*.—A small tree found in the hilly parts of the country, plentiful in the Matopos, also found as a much bigger tree along river basins in Lomagundi and Mazoe. The timber is hard and durable and does not rot in the ground, and is one of the best posts for fencing kraals.

Olea sp.—This tree, which is probably an *Olea*, grows to a large size in some parts, as at Wankies and Gatooma and South of the Matopos. The timber is very hard and resembles black ironwood and is used for similar purposes. Guide blocks, anvil blocks, foretongues and stills of wagons, etc. It very often occurs on ant heaps with Mashuma.

ASCLEPIADACEAE. *Gonioma kamassi* (Rhodesian Rubber tree).—A small tree usually found on rocky ground, on granite formation, irregularly all over the country. It is too small to be of value for timber, but it gives a latex used by the natives as bird lime.

SAPOTACEAE. *Mimusopa zeyheri*.—This tree is common about the Victoria Falls, where it grows to a large size. It is fairly common in the Cape Colony forests and has a good timber, much used for wagon building.

EBENACEAE. *Diospyrus mashuma*.—This is probably the most valuable tree in Rhodesia. Its timber is red, hard and durable. It is scattered all over the country, but never in any great quantity, occurring as individuals or groups on ant hills or river banks. The timber is excellent for wagon building, mining work and general carpentry, and has the advantage that baulks of fair size up to 30 or 35 feet can be got. Its fruit is a drupe and is edible. Native dugouts on the Zambesi are frequently made of this tree.

BIGNONACEAE. *Kigilia pinata*.—This tree, which grows to a large size in the warm valleys of the Zambesi, near Hartley, etc., has little value as timber, which is soft, with a stringy texture. Its fruit is a large pepo 12 to 18 inches long. The tree is evergreen and very ornamental and bears large graceful panicles of flowers which are very handsome in early spring.

STERCULACEAE. *Sterculia sp.*—A fairly common tree in the kopjes at Odzi, the Matopos and near Wankies, etc. It is one of the largest trees in the country. The bark is pinky-green and smooth. It is deciduous and the leaves, which

resemble huge plane tree leaves, fall in autumn. The timber is soft, but is said to work easily and dress well.

POTYGALAE. *Securidacca longipedunculata* (Violet tree).—This very handsome tree does not grow to a size to give timber, but is very ornamental when in flower and emits a delicious perfume like violets. It would make an excellent hedge. It grows plentifully in the Lomagundi, Mazoe and Salisbury Districts.

PROTEACEAE. *Fourea saligna* (Boukenhout).—This tree is distributed over a fairly wide area. It occurs in granite scrub at Fort Usher and Matopos, and as a much bigger tree on the edge of the sand belts at Ingandoma and on the formation at Lomagundi. Its timber is hard and has a pretty grain, handsome when polished or made into furniture. It is one of the best fence or kraal posts, being impervious to ants and borers. It will not split like sneezewood, but must be used round. Several allied varieties are found but these are of smaller size.

INDIGENOUS TIMBER.

The indigenous timbers of Rhodesia have been classed as durable and perishable hardwoods. No doubt some are more durable than others, but the term "perishable" is neither apt nor applicable. A large number of the trees give useful timber when properly treated. In any country, trees cut when required irrespective of season and used green, as is done in Rhodesia, could not fail to fall a prey to boring insects and fungoid decay.

Many of the timbers, such as Mopani, Knobby Thorn, Teak, Mahogany and others, are excellent hardwoods, suitable for any purpose to which such timbers are applicable.

The principal faults of the timbers of the country are the following:—Firstly, want of size. With the exception of one or two varieties, it is difficult to get timber big enough for saw milling purposes. Secondly, unsoundness. This is probably, as has been said, due to fire, but a large proportion of the logs show blemishes, hollows and faults, rendering them unfit for fine work and greatly reducing their value, while many logs are not fit to saw up at all. Thirdly, short length of bole. With the exception of Mashuma and Mabolo, short bole and spreading crown is characteristic of all the bigger trees. In the Teak and Mahogany forests, fine big trees with diameters up to four or five feet can frequently only give a length of six to ten feet, while twenty feet

lengths are quite the exception, and this is true of almost all the forests. Mashuma and Mabolo are exceptions and have often straight trunks cutting baulks up to 30 or 35 feet, but unfortunately are so scattered as to make a milling proposition speculative. Many of the timbers mentioned, while heavy and durable, are inclined to be short grained and brittle, and difficult in consequence to dress, but some such as Beukenhout, U'mangwe and Mahobohobo have nice straight grain and dress well. These trees, however, do not give baulks of any size.

The strongest timbers and those most prized for the mines are Mopani, Knobby Thorn, Mahogany and Mahobohobo, while others of less value but much used are Mtondo, M'sasa, U'mangwe, M'buti, M'busi, etc.

Teak, Mahogany, Beukenhout, Muwanga, etc., are useful timbers for cabinet work, carriage building and decorative house work. The coaches on the royal train for the Duke of Connaught are partly built of the former.

Many woods are used as wagon woods all over the country, but the following are probably the best :—U'mangwe, Hartekol, Mashuma, Mabolo, Mahogany, M'nondo, Mu'wanga and others. For fencing, kraal posts and posts for building, several varieties may be used. The following are, however, perhaps the best :—Beukenhout (Isidwadwa), Wild Wisteria (Umpaca), Mu'wangu, Ironwood and White Pear (*Combretum*) and Wild Olive, while any tree with a heart which withstands white ants and borers may be used.

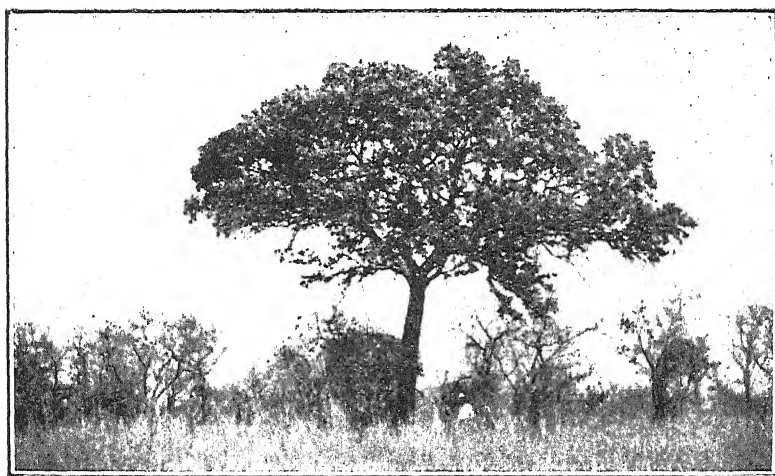
The greatest want is good, serviceable softwoods. At present, if any wood is soft, it is classed as useless. This is a great mistake, as a good, useful softwood to take the place of deal would be invaluable. The timber of one tree, *Kirkia acuminata*, was being worked at Inyoka and cut and planed as easily as deal, and this is, I think, worth cultivation. Another softwood is Rhodesian Plane (*Sterculia* sp.) but I have not seen this worked.

I have drawn attention to the perishable nature of timber cut and used green, and a few hints as to simple treatment may not be out of place.

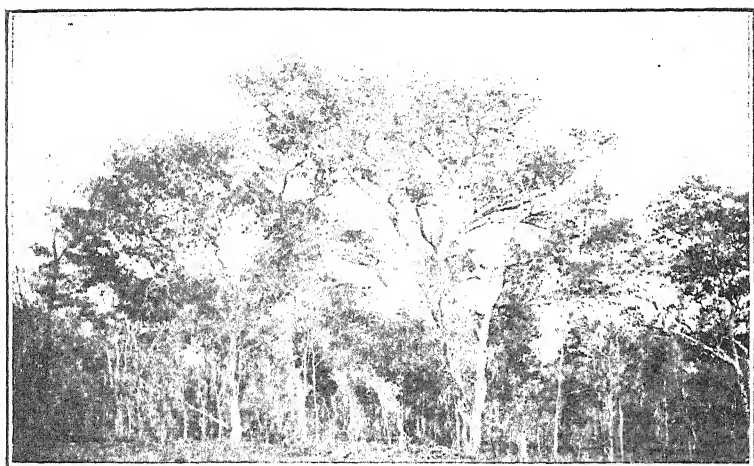
- (1) Cut in season. It is difficult to prescribe a cutting season as the different trees vary, but generally the season when the trees are most dormant is best for cutting, preferably late autumn or early winter.



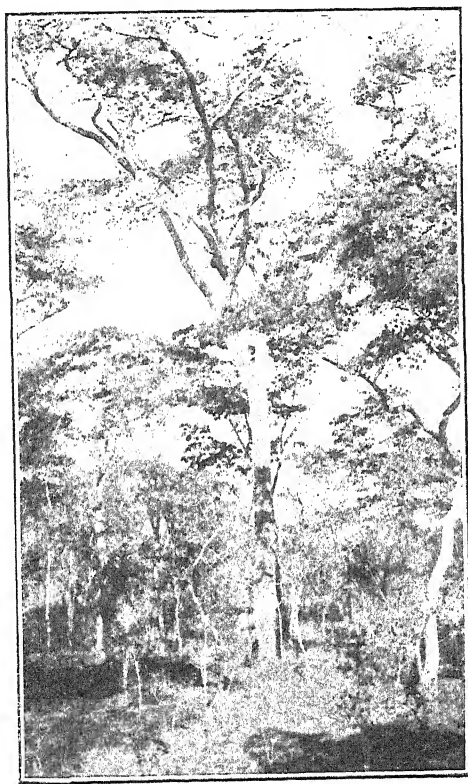
*Two M'futi trees (*Brachystegia* sp.) in different states of foliage,
though adjacent.*



*The Mobola tree (*Parinarium mobola*).*



*M'sasa Forest, Ingandoma, showing characteristic
two-storied character.*



M'sasa Forest, Skombela, Gwelo.

- (2) If it is possible, and more particularly if any growth is on the trees, let them lie as they fall for a day or two with all leaves on to draw the sap from the bole.
- (3) The bark should be removed as early as possible and the logs stacked in the open.
- (4) One of the best methods of seasoning timber, available to everyone, is water seasoning. The logs should be put into water for as long a period as they can be spared up to, say, six months. This treatment draws off much of the vegetable sap and soluble tissue which is attractive to borers and on which some of them feed, and thus makes them much less liable to be destroyed. Salt water is said to be better than fresh, but either is beneficial and may be used. Immersion in lime water, especially after water seasoning, is said to render timber less liable to attack by white ants or borers.
- (5) Charring.—The idea underlying this is the same as water seasoning, the removal of the vegetable juices and the hardening of the tissues, but to be effective it must be done thoroughly and the whole surface well charred. Mere scorching, which is so frequently seen, is useless.
- (6) Dressing with tar, salignum and such preparations are no doubt effective to the extent to which they render the timber distasteful to insects, and any substance that appears to be repugnant to them may be of service.

Imported timbers are frequently said to be impervious to borers, but this is incorrect. The timber, however, is seasoned—probably in water—and is, for this reason less attractive. Expensive treatment with creosote and other preparations is no doubt more effective, but the simple methods described harden the tissues and make the life of the timber very much longer.

THE TIMBER REQUIREMENTS OF RHODESIA.

It is not possible to give even an approximate estimate of the quantity of indigenous timber used in this country, but to judge from the areas of forest annually cut down, the amount must be considerable.

It is used for timbering and fuel for the mines, for erection of buildings, kraals, fences, etc., on farms, while natives use it for the erection of their dwellings and graneries. It is used in the manufacture of wagons, furniture, railway carriages, etc.; therefore, although there are many uses for which it is not suitable, it is a very valuable asset to the country.

Besides the indigenous timber, however, a considerable quantity of timber is annually imported and in increasing quantities year by year. The following table gives the value of imports for the four years ending 31st December, 1909:—

TIMBER IMPORTED INTO SOUTHERN RHODESIA

ARTICLE	1906 £	1907 £	1908 £	1909 £
Empty Boxes ...	54	90	184	116
Houses and Frames	2135	2337	4717	5189
Planed and grooved Flooring and Ceiling Boards ...	2884	4066	5264	7490
Other planed and grooved ...	—	—	3916	534
Staves ...	25	—	—	6
Teak, India ...	70	99	232	603
General Timber, Un- manufactured ...	15048	9423	11146	15828
Manufactured ...	2996	3491	3705	3107
Pick Handles ...	—	—	—	723
£	23212	19506	29164	33596

It appears certain that 1910 figures will very much exceed those given, and that the timber requirements will grow with its expansion.

The use of indigenous timber for small industries is increasing. In Victoria I believe one of the Dutch settlers does quite a nice little business in furniture, and I have seen several wagons made almost completely from Mashuma, Hartekol and Milkwood. In the future, trees useful for these purposes will be in demand.

DESCRIPTION OF FORESTS BY TYPES.

M'sasa Forests.—These forests cover a large area, and in themselves vary exceedingly, from the merest scrub to trees 60ft. high from which baulks of timber 12ins. square could be cut 20 to 30 feet long, with a very large number of smaller trees suitable for mine props and round lagging.

Although called M'sasa Forest from the predominating species, a variety of trees are found in these forests in considerable numbers, and indeed, at times the M'sasa (*Brachystegia Randii*) almost disappears and is replaced by M'tondo (*B. sp.*), or M'Futi (*B. appendicularis*), and on the kopjes by M'busi, Mountain acacia (*B. sp.*)

The forests usually appear to be two storied although open. The Brachystegias and several other big trees forming the top story and the ground covered with scrubby plants of the same varieties or others, several species of strychnos or kafir orange being noticeable.

Associated with the Brachystegias, but frequently not all in one belt are the following trees of some value:—Um'vagazi, Bloodwood (*Pterocarpus angolensis*), Mahatsha, Grys Apple (*Parinarium mabola*), U'Mangwe Yellow Wood (*Terminalia sericea*), M'nondo (*Burkea africana*), MoMungu (*Pterocarpus sericeus*) and other smaller trees.

This type of forest is confined to no particular soil, good forest being seen on the sand belt at Ngandomo, on the granite near Rusapi and Odzi and on the formation round Que Que, Salisbury, Lomagundi and Mazoe.

The timber in this type is not of a high order, being almost all liable to destruction by white ants and borers. Mutondo is probably the most durable. This class of timber

is not purchased by the mines if the better hardwoods are available, but is used in considerable quantities where this is not the case. Mine Managers do not recognise the different varieties, but class them all as native woods.

A very large number of the trees are damaged, greatly reducing the value of a forest as a whole, and the larger part of this type of forest, although containing much of the smaller mine timber, can supply little or no sawable timber. It is only from the very best areas that this can be extracted and these are at present far from mines and railways.

Trees of this class appear to grow fairly fast and probably like some of the Acacias and other Leguminosæ, are short lived and could be easily raised as plantations.

IGUSI OR RHODESIAN TEAK FORESTS.

These forests are found only on the deep sand belts on the sandstone formation, as in the neighbourhood of the Igusi, Khambi, Gwaai, and Shangani Rivers.

Igusi (*Baikia plurijuga*), which is the principal species, is a large tree up to 60 feet in height, of a spreading habit, giving short lengths of valuable timber from 6 to 20 feet, but seldom exceeding 12 feet, and with a diameter from 15 to 36 inches. Associated with the teak, the principal timber tree is what is locally called Mahogany or Bastard Mopani, Um-Tshibi (*Copaifera colcosperma*). This tree is fully as big as the teak, and gives better and sounder baulks of timber, but the trees are much less plentiful. Occasionally, trees of the Mahogany Bean, Umkamba (*Afzelia cuanensis*) are seen, and considerable quantities of the following smaller trees:—M'simba (*Burkea africana*), Umvagazi, Bloodwood (*Pterocarpus angolensis*), Umangwe (*Terminalia sericea*), and occasionally *Brachystegias*.

All these produce straight poles suitable for mine work. There is also a considerable variety of small trees or shrubs, forming a very thin undergrowth.

The forests occur on belts on the sand ridges which form watersheds, either between rivers or between vleis. These belts vary in size and quantity in a marked degree, some being large and fairly well stocked, while in others the trees are small and sparse.

The vleis between are either bare with patches of scrub, or are covered with belts of inferior Mopani, and are sometimes of considerable extent with good fertile soil. In the river basins various forms of *Acacia* are the special feature, and some of these form large trees, the economic value of which is not known. Even on the best belts, the stocking of timber is poor, and on what I consider an average area, I counted 40 stems of all species, from 8 to 36 inches diameter with from 7 to 20 feet sawable timber on each, but as a large proportion of the area does not carry marketable timber, a sample area of a square mile or so will be necessary to ascertain the general stocking.

Evidences are seen all over the forests of the ravages of veld fires. Stumps show that fine big trees have been burnt right out, while the large majority of trees now standing show blemishes of greater or less extent caused by fire, and there is no doubt that much of the unsoundness of the timber is due to this cause.

The re-growth is in many cases very good, and if grass fires could be controlled, gives promise of excellent results, and with a little assistance in the way of clearing out worthless varieties, and sowing seeds of the better varieties collected on the spot, in prepared ground, I feel sure a valuable forest would result. Cultivation would be easy on the belts, which are huge beds of sand said in places to be one hundred feet deep, and on which seed beds would be cheaply and easily made. The forest soil does not appear to me to be suitable for agriculture, and the cost of clearing would be heavy, while the danger of sand drift if the land were cleared must not be lost sight of. The country where these forests occur is not a healthy one, owing to the vleis, which are simply swamps during the wet season, but this might be improved by planting *Eucalyptus*.

MOPANI FOREST.

This class of forest occurs in belts, more or less extensive, some being only a few acres while others extend for miles; a belt three or four miles long and one mile broad being spoken of as a large one.

These belts appear in a peculiar fashion on a great variety of soils; on some sandstones they are good, while on others

they are poor or absent. Belts occur on poor granite, on a mixture of granite and schist, and on the schist formation, appearing and disappearing in a rather unaccountable fashion.

Mopani (*Copaifera mopani*), the principal tree in this class of forest, is exceedingly variable in size. Good trees are found cutting 12 to 18 inches diameter with 18 to 20 feet of bole, but these are exceptional. In the majority of the belts the diameters are small and the length of bole low.

Associated with Mopani is Knobby Thorn (*Acacia nigrescens*), which forms a fine handsome tree with a bole up to 25 and 30 feet high. It usually occurs scattered or in groups, and is easily recognised by the excrescences or knobs which cover its bark.

Mashuma (*Diospyrus mashuma*) frequently occurs on ant heaps or good soil in the belts, with Citamuse (*Lonchocarpus capassa*), and on kopjes which are frequently adjacent are found UmVimela (*Kirkia accuminata*). IGonte, Mountain Acacia (*Brachystegia* sp.), UmKambu Rhodesian Mahogany (*Azelia cuanzensis*), Maroola (*Sclerocarya caffra*), and in places which suits it, the wonderful Baobab (*Adansonia digitata*).

The soil on which Mopani grows is almost always a firm one, although not necessarily rich, as excellent tobacco is grown on land cleared of Mopani at Inyoka.

The re-growth of Mopani is almost everywhere poor, and is scrubby and low where it has established itself. In many large belts, however, it is entirely absent, the trees, if big, standing quite in the open. Such forests are usually sparsely stocked, although belts of small trees may be quite close.

These forests are valuable to the mines as the timber is hard, durable and borer and ant proof, and big prices are paid for good material. At one mine 45/- is being paid per log of 18 feet long and approximately 12 to 14 inches in diameter.

The Mopani is, however, very susceptible to veld fires and 90% of the trees in many of the belts are more or less damaged, while in some, where the trees are big, heart rot is very common, so that although the timber value is high, the value of forests is greatly reduced owing to serious faults and blemishes in the timber.

That both Knobby Thorn and Mopani grow freely from seed sown in situ was seen at Matopos Park, but I am not very sanguine of successful regeneration of these valuable trees, either by improvement of the belts or as plantations, as they are evidently slow growing and the danger from fire is great. Regeneration in both ways is, however, well worth trying.

MASHUMA FORESTS.

This valuable tree does not occur in belts large enough to be designated as forests, but is usually found isolated or in twos or threes, generally on or around ant heaps, or on any bit of good soil which is not vlel, where they do not occur.

They sometimes occur in M'sasa belts, more frequently with Mopani and Knobby Thorn and more frequently still in scrubby forests with M'citamuse (*Lonchocarpus capassa*) Mountain acacia (*Brachystegia* sp.) and others. In some places red milkwood (*Mimusops obovata*) shares the ant heaps with it, and another valuable tree, Hartekol (*Olea* sp.) is frequently associated with it.

Although a valuable tree in itself, growing as it does to 3 feet diameter and up to 35 feet of clean bole, its value is greatly reduced by the irregular and scattered manner in which it occurs, and I know of no place where I could recommend a sawyer to put up even a small plant with the hope of getting sufficient timber within a workable area to keep him at work for a reasonable period.

It has an edible fruit which is freely eaten by the natives, and it is said to grow freely from seed. It is noticeable, however, that it has little or no regrowth naturally, and it may be that grass fires are responsible for its unique position on the ant heaps, having destroyed its cogenors. In a protected plantation it might do well.

Although isolated as individuals, it still occurs in belts, often of considerable extent, where its fine proportion perched frequently on an ant heap makes it a conspicuous object, as at Gatooma, although it has been considerably cut near there to supply Messrs. Wiggins & Laws' saw mills.

MAHOBOHOB Forest.

This tree occurs in belts or groves, principally along the gold belt, forming almost pure forest where they occur, and

although the area which they cover is limited, they are worthy of consideration, as the timber is prized by the mines and also for house building.

The trees are never of large size, but make excellent shade with their large stiff leaves, and growing in almost pure groves would soon, if fires were excluded, form almost true forest conditions.

The fruit, which resembles a loquat, is edible and hundreds of the smaller trees are cut annually so that native boys may easily get at it.

The tree grows readily from seed, and although it is improbable that it can be grown off the warm valleys of the gold belt with success, experiments should be made there with a view to improving and extending the stands and forming new plantations.

Scrub Forest.—If the scrub which covers a very large area of this country can be classed as forest, it requires to be shortly described although its value is very little except for firewood.

Excluding the Mopani, the Mashuma, the P'gusi and a part of the M'sasa forests already described, all the rest come under this appellation.

The *Brachystegias* frequently cover vast areas which are worthless except for fuel and very light work, but besides these, and quite separate from them, are large areas covered with a more or less close covering of mixed scrubby forest, sometimes quite open park-like savannah, and sometimes so dense and thorny that it is difficult to pass through it. In such forests as these, the principal varieties are:—Rhodesian Black Wattle (*Peltiphorum africanum*), M'pefa (*Wach en bitje*—*Zizyphus mucrumata*), Merola (*Sclerocatra caffra*), Rhodesian Wisteria (*Bolusthanus speciosus*), Muwangu (*Dom-beya rotundifolia*), M'citamusi (*Lonchocarpus speciosus*), Rhodesian Rubber Tree (*Gonioma kamassi*), Umkale, Kaffir Orange (*Strychnos* sp.), Leadwood, Bush Willow, etc. Varieties of *Combretum* are characteristic of these forests as well as several species of *Acacia* and *Rhus*, also Kaffir Boom (*Erythrina tomentosa*), Rhodesian Laburnum (*Cassia grani-tica*) (*Bauhinias*), *Protias* of several kinds and several species of *Ficus*.

These trees and many others form the scrub which is scattered over the country, and occupy belts between the better class forests in which they are also frequently found as undergrowth.

The forests, although inferior, contain many trees which have considerable value to farmers and to miners. They supply wood fuel and charcoal. Several varieties, such as Rhodesian Wisteria and one or two Combretums stand well in the ground and are useful as house props and fencing poles. Kaffirboom is prized for brake blocks; Bauhinia is used for yokes, and many others have local uses, and where they are in quantity the value of forests is by no means to be dispised. Among the scrub forests are patches of good bush, and along river banks, such as near the Victoria Falls and other places, scrub is relieved by fine big trees, which, of course, are also sometimes found in similar situations in other types of forest. Among such trees may be mentioned Cape mahogany M'Sikele (*Trichilia emetica*[?]), Rhodesian Mahogany (*Azelia cuanzensis*), Sausage tree (*Kiligia pinnata*), Baobab (*Adansonia digitata*), Waterboom (*Eugenia cordata*), and others which seldom occur in close forest, but usually as isolated specimens. Several Acacias also form fine big trees, and groups in situations of this character such as *A. albida* (Umpumpu), *A. nigrescens* and others. Many of these trees are of considerable value.

Such scrub forest is not worth the expense of protection or demarcation, and unless there is some special reason such as mines requiring timber in the immediate vicinity, they need not be considered.

MOUNTAIN FORESTS.

These are of two distinct classes, the one being patches of real forest occuring on the escarpment almost entirely on private property, and apparently remnants of much larger forests in former times which have been gradually reduced by native axe and by fire to a few isolated patches high up in the mountains.

The trees in these forests are mostly of varieties unknown to me, and as I saw them when neither flower nor fruit was obtainable, it was not possible for me to get them identified.

Many of the trees are large and no doubt useful, but the area is so limited as to have little economic value, as the quantity of any one timber is very small. These forests were at one time probably continuous with those of German East Africa which they are said to resemble. The character of the forest, however, is of the forestal type, as seen on the mountain forests of the Cape, Natal and further north with large straight boles 50 to 60 feet high and even over, and dense undergrowth of Monkey Rope and thorny scrub. Even in the winter, it is in semi-darkness and the forest floor is quite clear of grass, and is covered instead with ferns and forest weeds.

The potential value of the adjoining land for plantations is great, as it is frequently enveloped in mist for weeks at a time, and will be referred to again.

The other class of mountain forest is that which is found on the inland ranges of mountains or hills and is very different in character. These ranges are composed of granite kopjes, schistose rocks, dolorites, sandstones, and limestones. In all cases these inland hills are wooded, sometimes indeed with mere scrub forest, but in other cases closely covered with mountain acacia and other *Brachystegias*, *Kirkia* *accuminata*, Mahogany and other big trees, and it is a noticeable fact that near the base of the hills in most cases the forest improves to a marked extent. This has been explained by stating that the hills are not so subject to veld fires, but although there is probably truth in this assertion, I think that the heavier rainfall and mist on the hills has given rise to a better tree growth, and therefore it would be wise to protect the forests and try experiments to improve them and to introduce exotics. In several parts of the Cape, tree planting on level ploughable land has had to be discontinued, and the mountain work, which is much more expensive, taken up, and always with success. Similar results may be looked for here.

(To be continued.)

How Maize Growing can be made more profitable.

By H. GODFREY MUNDY, Agriculturist and Botanist.

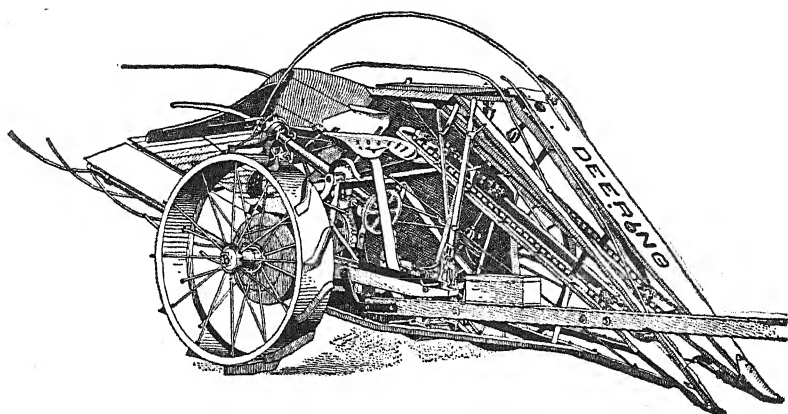
Farming in Rhodesia is greatly handicapped by restricted markets. In spite of large and ever increasing mining development, farmers are unable to dispose of many crops which might otherwise be grown well and profitably. Potatoes in particular can be produced in winter and summer, but through lack of organised demand become a drag on our markets. It is almost of weekly occurrence to hear of farmers who have several hundred bags of potatoes and are unable to find a buyer for them. Pumpkins in unlimited quantities might be grown, but farmers who have planted largely in the hope of finding a market on the mines have usually learnt to their disappointment that a very limited demand exists for this article of diet. Similarly, the market for Ground-nuts appears uncertain and the demand unreliable, and were it not for this fact farmers would feel justified in purchasing costly machinery for reaping, threshing and shelling the nuts, and could then produce more than sufficient to meet the requirements of every mine in the country. One might expatiate on the instances in which this occurs, but for the present it is unnecessary to labour the point; economic conditions cannot be changed by a stroke of the pen, and a consuming population in proportion to production can not arise save by process of time and development—fortunately there remains one crop for which a market is always assured.

Southern Rhodesia has reached a transitional stage—our difficulties to-day are those which every young farming country has had to contend with. Production is increasing out of all proportion to local demand, thus bringing about a consequent fall in prices. A few years ago maize was fetching 20s. to 30s. per bag, and the settler who had grown his 500 bags was well satisfied and counted himself on the

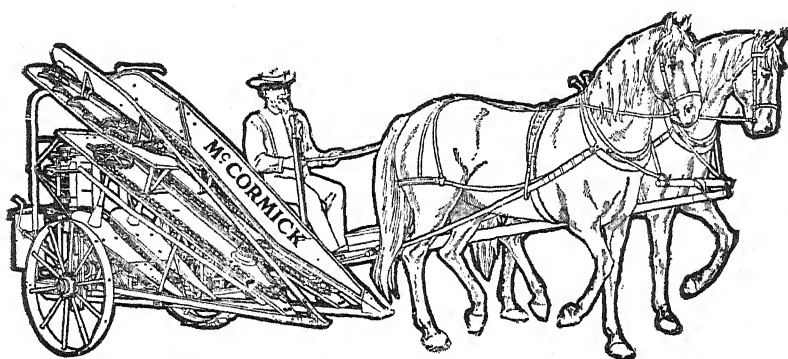
fair road to competency. Today our largest growers are not satisfied with their 5,000 bags, and many of the newer comers look forward to the time when they also may count their crop in like figures. Maize at 25s. per bag may mean money to a few, but at 9s. to 10s. per bag it spells profit to many, both consumer and producer. It is the staple item of diet of the native labourer, and cheap food supply is one of the factors influencing mining development; the extension of the mines means more money spent in the country and vastly increased local markets, not for maize alone, but eventually for all other agricultural products.

In spite of her actual position as regards the coast, Rhodesia is handicapped by reason of the great distances which lie between her main consuming centres, and by the disabilities which separate her from "Blue Water." Her railways, constructed at considerable cost as per unit of white population, must for the present be run as commercial concerns, and cannot take the form of agricultural doles as has been the case with some of the branch lines of the Southern Colonies.

As a consequence of this combination of difficulties, the profits derived from many farms, particularly those remote from the railway, are reduced to a minimum, and the complaint is heard on all sides that new crops are needed and must be forthcoming. It is a matter of extreme simplicity to raise the cry for new crops which will return better profits than does our present staple crop, but out of all proportion is the difficulty of finding and establishing such crops. The drawbacks which retard one line of farming enterprise have often, to a great extent, the same relation to another. Transport facilities is the problem which largely affects maize growers in the outside districts untapped by a railway. The same trouble arises to confront any other bulky or perishable crop, be it cotton, hemp, forage, citrus fruits or sugar beet, and added to this, where local industries are aimed at, is the difficulty of attracting capital for problematical agricultural ventures, the success of which are influenced by innumerable supplementary conditions such as cost of production, skilled labour supply, output of raw material, season, quality of article produced, etc.



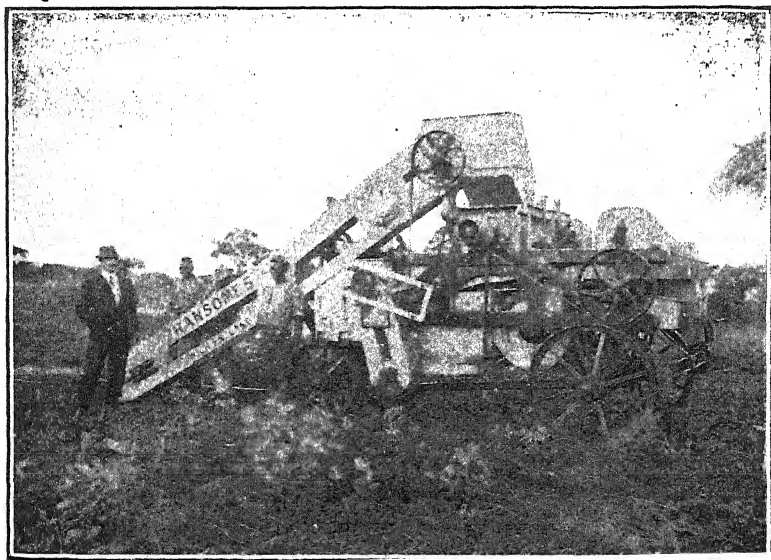
The Deering Maize Harvester with binder attachment



The McCormick Maize Harvester

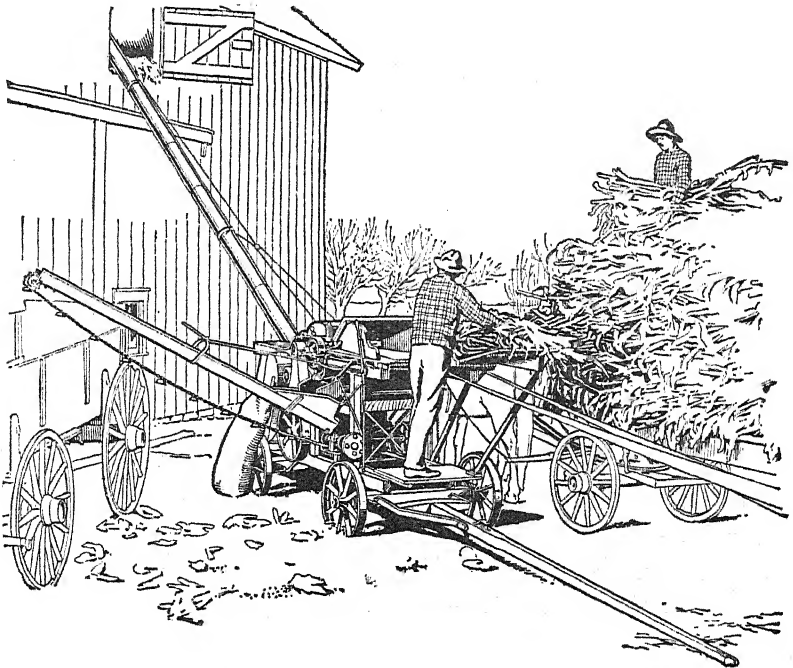


*Power maize sheller, 42in. drum, working on Mr. T.
Pretorius's farm, M'Gutu, Mazoe. Capacity
600-700 bags per diem*





Shelling maize by power on Mr. Haupt's farm, Salisbury. The sheller is run by a 6 h.p. Daimler motor, oil fed. Capacity 40-50 bags an hour.



The McCormick husker and shredder as used by Mr. Rorke. Crocodile Valley, Umzingwane

The urgent need for alternative crops cannot for a moment be denied—the question of rotation is sufficient justification in itself, and the fact that farmers are demanding them is a sign of progress—but the fact must not be lost sight of that to demonstrate the suitability of any crop to local conditions requires careful investigation for several years, and no one is justified in recommending a particular crop on a large scale until it has been proved conclusively that it can be produced with reasonable certainty and can be relied upon to give satisfactory profits either for home feeding or for sale. Similarly though there are even at the present time several crops, the production of which might be increased a hundredfold or more, yet in most cases it is useless to do so until a local South African or export market is assured. South Africa in the past has often been accused of being a country of samples, and simply for the reason that though it may be quite feasible to produce cotton or sugar beet or any other crop on a small scale and of excellent quality, yet the difficulty of establishing these as agricultural industries may remain for the time being practically insurmountable.

Bearing these facts in mind it is impossible to avoid feeling that the practical may in some cases be obscured by the visionary—the bird in the hand sacrificed for the bird in the bush. In maize we have a crop which has been proved throughout the length and breadth of the country. Broadly speaking it is better understood and offers better possibilities to the inexperienced or recent settler and also to the scientific farmer than any other crop one can name. In spite of the fact that local prices have dropped and shipping rates for export have been unavoidably increased, there yet remains a margin of profit, and a market either local or oversea can always be relied upon. It is doubtful whether any maize-growing country in the world is endowed with more favourable natural conditions than Southern Rhodesia. The crops, on what may be termed the maize belt, are not as a rule considered fair much less particularly good, unless at least seven to nine bags per acre have been reaped. What has been done for it and what return is being given to the land to replace the plant food which the crop has exhausted?—in the vast majority of cases next to nothing.

We frequently hear it said now that there are no profits in maize growing. Let those farmers who hold this view ask

themselves what they are doing to make it profitable. The man who is situated near a railway finds it remunerative to produce, let us say, eight bags per acre. Is it not possible to pay for the increased transport rates from farms more remote from a railway, and where often the soil is of far greater fertility, by increasing the production to twelve bags, and is there any reason why this should not be done? For several years now the present price of Rhodesian maize has been the current price in the Transvaal and Natal, while the average yield in those Provinces without manure is very considerably less than ours, and yet maize still remains the staple crop of the bulk of the Natal and Transvaal farmers. Natal is giving South Africa a lead, and is doing everything possible to improve the necessary cultural methods, and by the use of labour-saving machinery, to achieve this improvement with reduced working costs. What the Natal farmer, assisted by his proximity to the coast and to supplies of artificial fertilisers finds essential, may safely be taken as a fair guide for us in Rhodesia.

Does it not seem advisable then while loosing no opportunity of testing other crops, the final success of which is at present uncertain, even greater attention should be paid to perfecting our methods of cultivation and handling of the one crop, which except under abnormal conditions, can be unfailingly relied upon?

To compensate for reduced selling prices, economy in cost of production is of the first necessity, and in conjunction with this must come increased returns per acre. Co-operation has done much to further the interests of farmers in the marketing of the crop; is not the time now ripe for co-operation to go still further, and by the adoption of the principle, by small groups of farmers to reduce the cost of production to the individual. In the last issue of the *Agricultural Journal* reference was made to a power threshing machine in use in the Mazoe district which shells the grain from the unhusked ears. Would it not be possible for the local Farmers' Associations to combine and purchase similar machines for the joint use of their members, or failing this, could not the Co-operative Society purchase two or three travelling threshing outfits and station these at convenient centres for the use of its members—a fixed charge being made for every bag

of grain shelled. In older established countries similar methods are followed in the threshing of cereals such as wheat, oats and barley. Few individual farmers can afford a threshing outfit for their sole use, and by some arrangement similar to the above, or by individual private enterprise a power shelling outfit might be placed at the service of farmers, for hire in the different districts. This method alone would serve to considerably reduce the labour bills of our farms and thereby cheapen production, and at a time when native labour is a matter of anxiety, appears deserving of attention.

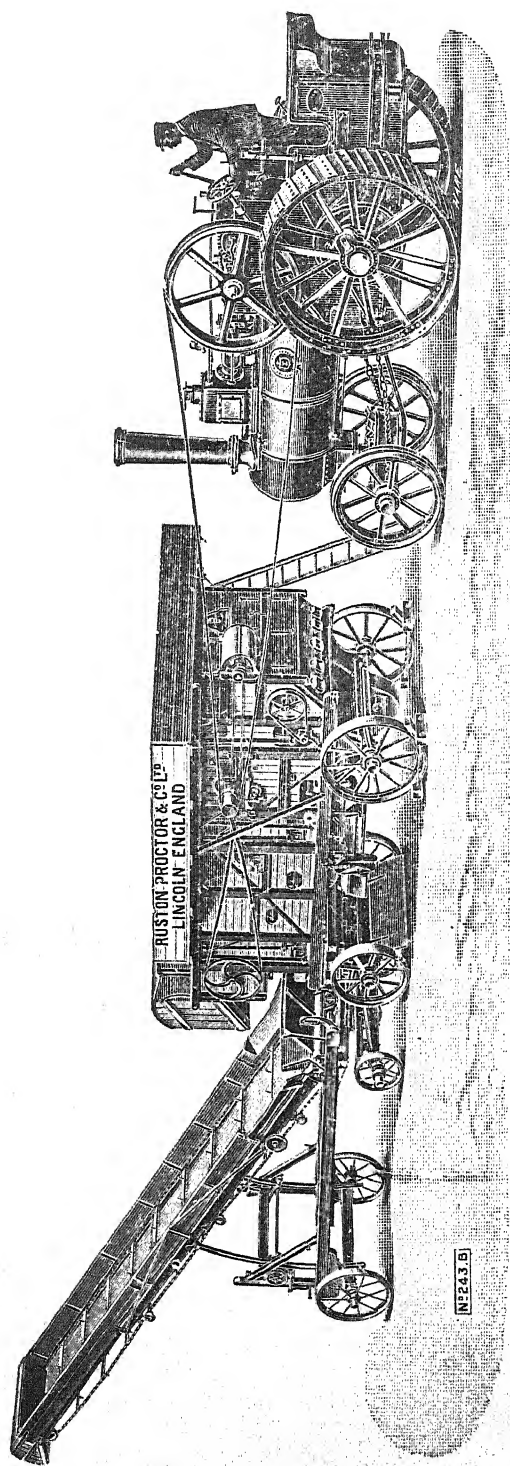
In the majority of cases the present methods of handling the maize crop are costly out of all proportion to the return. Seed is often planted on land which has perhaps not been touched for several weeks, and on which an abundant crop of weeds is just coming into existence. Cultivation during the first few weeks after planting is often more or less neglected, with the frequent result that if the crop is to be kept clean at all, hand hoeing must eventually be resorted to. The system of check row planting even on the dirtiest lands is seldom or never adopted. When mature, the crop is picked and husked in the field by hand, with a result that a larger staff of boys is necessary than would otherwise be required, and that a few grains—totalling in the aggregate a considerable number of bags—are lost from every ear. Small hand power shellers, usually without elevators, are used, which entail a great deal of manual labour, and which often do not thoroughly shell the cob or clean the grain. These methods are excusable in the case of a new settler with limited capital, but can hardly be condoned in the more thickly settled parts, where within a few square miles there are often three or four growers producing between them ten or fifteen thousand bags of grain. The enhanced profits obtained by the use of labour saving machinery would come near to paying for the same the first season, and the constant anxiety regarding labour supply would be to a great extent removed.

Having once successfully demonstrated the practicability of co-operation in shelling the grain, it would not be long before means might be found to extend this to harvesting machines which would cut and bind the standing crop, and so obviate the enforced idleness of ox power which now frequently occurs during part of the dry season. Following

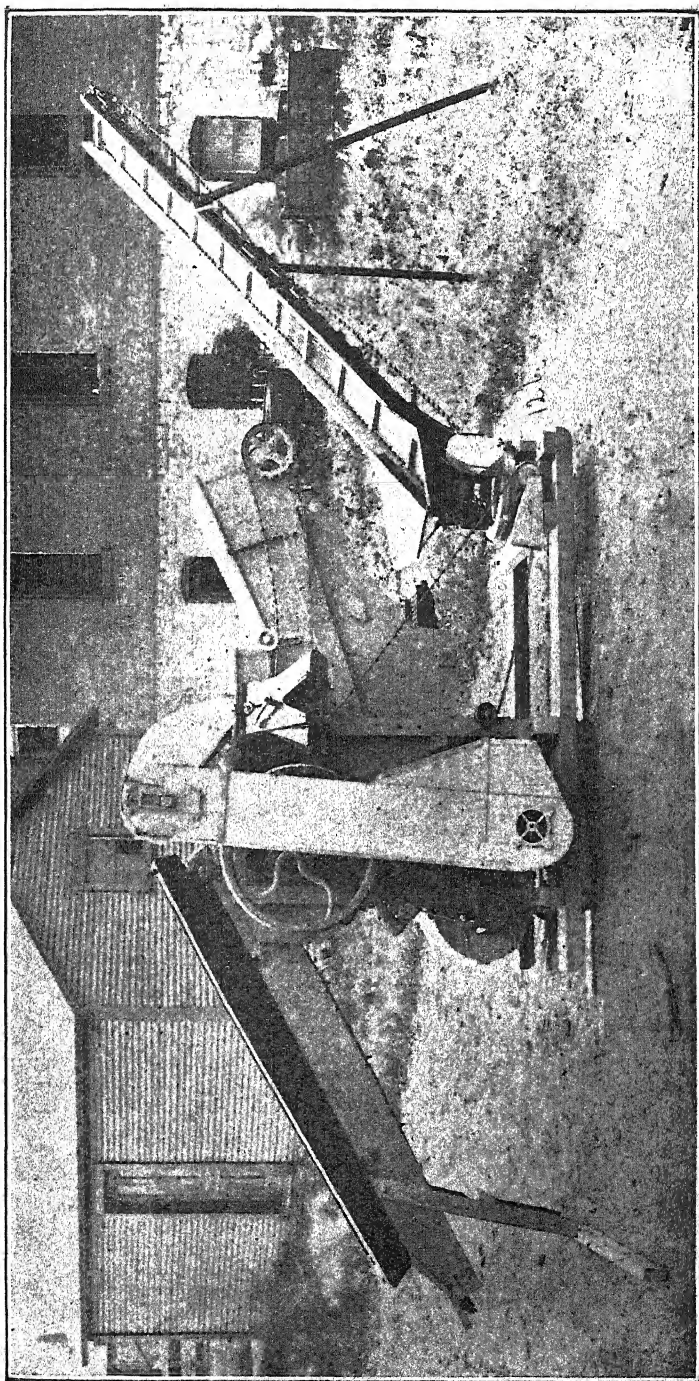
this, and in districts where the acreage is sufficiently large, as for instance around Salisbury and in parts of Mazoe, might come the steam plough and the more common use of the road traction engine or road motor for hauling the grain to the railway. As a result of the smaller amount of time necessary for supervising the harvesting and shelling of the crop—more time could well be spent in seed selection and in maintaining a breeding plot to provide selected seed for the next season's planting.

These suggestions are not born of mere optimistic supposition. Co-operation is based upon similarity of interests, mutual trust and good faith. Rhodesian farmers have already shewn themselves able to unite and form strong and concerted Co-operative Societies. Is the time not ripe to go a step further and to carry co-operation among individuals into the more strictly practical side of production?

The second way in which increased profits can be obtained is by raising the yield per acre. The present tendency is to increase the total production of the farm but not necessarily the acre yield. The explanation is that farmers are breaking up more land every year, and the man who has two hundred acres under crop this year hopes to have three hundred next season. Within certain limits this is sound economy, but many growers have reached a stage when larger acreage means increased capital outlay, working expenses and risks, which can be ill afforded. These are precisely the conditions which, though tending to greater turnover, yet lend themselves to careless farming and militate to a considerable extent against increased profits. The writer was recently discussing the question with a leading grower who produces his 4,000 bags or more, and asked the question:—"Are you manuring your land or taking any steps to augment your supply of farm-yard manure"? The reply was brief and unexpected—"No, it would not pay me, I've too much land to manure and the labour would be too great." Is not this the attitude which the majority of Rhodesian farmers adopt towards the vital questions of seed selection, crop rotation, and manuring? There are of course exceptions, yet I venture to think that the number, who are enhancing their returns by systematically following these practices are few compared with those whose efforts are but half-hearted, and who therefore complain that the profits on maize growing barely afford



The Federal combined stripper, thresher, winnower and bagger



The Marseilles-Adams 6 h.p. sheller, for husked or unhusked ears. A portable machine of this type is used by Mr. B. A. Bland, Thornville, Insiza.

a livelihood. It is the stretches of poor or ill-prepared land which reduce our average yields. They entail practically the same amount of capital outlay and labour to maintain in crop, and the profit derived from them may be little or nothing. The best maize soils in the country yield an average crop of ten to fifteen bags per acre, and from specially favoured patches as much as double this yield is not infrequently reported. By the addition of manure and the use of selected seed many of the poorer soils could undoubtedly be induced to crop equally heavily, while the richer lands might on the average produce their twenty and twenty-five bags per acre. Throughout the 80—90 million acres of the corn belt of the United States of America, the average yield is reported to vary from about 7—10 bags per acre. In Victoria, Australia, there are upwards of twelve thousand acres under maize, yielding an average crop of about 18 bags per acre. In many cases high farming is practised and liberal dressings of farm-yard and artificial manures are applied in order to produce these crops. Given the soil of sufficient *virgin* fertility which, when assisted by only the most rudimentary principles of good husbandry, will produce nine to twelve bags per acre, as does the Rhodesian maize belt, who will venture to place a limit to these returns if scientific application of the principles of seed selection, crop rotation and manuring are applied. Yet at the present time the making of farm-yard manure is often considered too laborious, rotation of crops too far-fetched unless a direct cash profit is obtained, and seed selection worthy only of the attention of kaffirs with occasional supervision by the farmer.

Is it surprising that the profits on maize growing are not what they might be?

For the further prosperity of the country it is essential that other crops should be found, but this, under the most favourable conditions, will require several years of investigation before the best can be made of them. Meanwhile as long as maize remains a crop which can be relied upon with such certainty, both as regards production and disposal, is it not to the obvious advantage of every farmer to reduce the cost of production by the methods here advocated, rather than to hastily turn aside to other spheres of uncertain agricultural activity, and so perhaps sacrifice the substance for the shadow?

Cattle Breeding in Rhodesia.

By MAJOR R. GORDON, D.S.O.

There apparently is not much difference of opinion as to whether Rhodesia is a good cattle country or not. Everyone seems to regard it as excellent, but some who profess to be very optimistic about the country, as a cattle country, notably, Professor Robert Wallace (whose opinions must always carry great weight) rather condemn it when they argue that it is more or less necessary to cross well bred bulls with the local females, which, generally speaking, are very inferior animals indeed, and would be shot at sight on many ranches in other parts of the world.

Rhodesia cannot compare with America, Australia, or the Argentine as a cattle country, if this is necessary. I am more optimistic than those who so argue about Rhodesia. I feel sure that the breeder who can afford to import well-bred bulls, will outpace his neighbour who cannot afford to do so.

It is a well known fact that well-bred bulls do acclimatise and become as healthy and strong as they could be in any other country, and no doubt heifers would acclimatise equally well.

To cross with any of the South African cattle means a backward step, if my contention is correct when I say that Rhodesia is a good enough country to breed pure-bred cattle in. To breed up from most of the local South African stock must mean a long wait for the breeder to see "a herd to be proud of" on his ranch. The first cross may be fairly satisfactory, but there would probably be a deal of disappointment later in the number of "throw backs."

I compare Rhodesia to Queensland, which is a part of the world very similar to Rhodesia in a great many respects, particularly as regards climate, the great dryness of the

grasses for a period of the year; heavy rainfalls during the rainy season, etc. I know both these countries very well. In Rhodesia the droughts are not nearly so prolonged as in Queensland, but the grasses lose their nutritious qualities rather more quickly. This again balances matters in comparing these two countries.

In the dry parts of Queensland the North Devon Cattle are generally preferred, being a particularly hardy breed, splendid beef cattle, early maturing, and though the country may be open and unfenced for hundreds of miles the herd does not become as wild and unmanageable as some other breeds are inclined to become.

In the more settled parts of Queensland the North Devon is not so much in favour owing to the fact that they are not good milkers. For these reasons I think the North Devon the most suitable breed for Rhodesia.

In a pamphlet published by the B.S.A. Co. I notice Professor Wallace condemns the system of kraaling cattle. I am very glad not to again differ with that well known authority. I have often seen cattle put into a kraal before sundown and not let out again till 10 or 11 next day. The kraals are often very wet, and by regular use become quagmires. Far too many cattle are put into one kraal, any beast that attempts to lie down is likely to be horned and disturbed by another beast at any moment. It is surely impossible for cattle to do well under such a vile system. At the very time that cattle dearly love to feed they are locked up in an overcrowded kraal. If they were out all night in a big paddock several miles in extent, surely they would be healthier than those kraaled. I am quite aware that in some parts of Rhodesia there is a danger of losses through wild animals killing cattle, but the percentage of losses in that way, in most parts of the country, would probably be less than the loss of calves through the damage done to springers when they are penned up in a kraal.

Trout Acclimatization in Mashonaland.

By C. DIMMOCK.

At this time when the acclimatization of trout is being attempted in North West Rhodesia, perhaps an account of four years experience of the same experiment in Southern Rhodesia will be of interest to sportsmen and others, who must have been impressed by the beautiful rivers and streams throughout the country, which look ideal for the attempt.

The invention of the Floating Hatching Box, designed by Mr. F. G. Chaplin, late curator of the Perie Hatchery, King William's Town, and now curator of the Government Trout Hatchery, Stellenbosch, and the undoubted practicability of ova being despatched by parcels post over long distances extending over many days, has brought success in this direction within measurable distance, and all seems now to depend on the operator's experience of local conditions and procedure.

The Chaplin floating hatching box consists of a frame box three feet long by fifteen inches wide and twelve inches deep, covered on the ends sides and bottom with perforated zinc of the gauge of 84 perforations to the square inch. This box is caused by attached floats to swim within two inches of the surface. Every inch of exposed wood surface must be carefully painted over with Asphaltum varnish, that is coal tar thinned down with turpentine to the consistency of varnish, in order to give no opportunity to the dread fungus disease of trout ova to obtain a footing, which it readily would do on bare wood surfaces left unpainted, killing all the eggs with great rapidity.

CARRIAGE OF OVA.

The ova are timed at the hatcheries so as to leave for their destination at a time just within the hatching period, necessary to last over the journey they have to make. No time should be lost therefore, on arrival, in getting them into the hatching box; which should have been floating ready two or

three days before ; as they seem timed to a day, and the first twenty-four hours sees hundreds hatched out.

The ova are packed about 500 together, sandwiched between two pieces of muslin about five inches square, which in turn are sandwiched between layers of wet spagnum moss, with a good margin of the same material all round between them and the sides of the box. They thus keep moist a long time in transit.

Before turning the ova into the box a good sized basin should be handy, full of water. Taking the top layer of moss carefully away, the muslin containing the ova is then picked up carefully by all four corners and immersed in the basin. Then, as the muslin is folded, take hold of the two opposite corners and lift up the top piece and gently draw the muslin away from the eggs.

Now, without delay, pour off some of the water which carries off the floating bits of moss before they sink, as they must not go into the hatching box, being liable to encourage collection of bits of ova, etc., and being about the appearance of *byssus*, the fungus aluded to. Add fresh water to the basin and proceed to pick out all dead eggs, which cannot be mistaken, as they will be milk white. Any eggs stuck together, however well they look, must be removed, as this sticking is a sign of the *byssus*, the deadly fungus arising from dead eggs and fish. The ova being now clean, take up the dish and carefully immerse one side in the box, and with a backward drawing movement all the ova will be liberated into the box ; then taking a feather (turkey's wing), wave it just over the eggs and spread them evenly over the bottom. Remember that ova and young avelins are easily damaged if poked about, even with a feather, so use the current caused by waving it over them. Proceed in this way with every layer of ova, all the while carefully keep everything from the sun's rays, and between each operation replace the lid loosely over the box. When all the ova have been placed in the box replace and lock the lid and do not open again for 24 hours, and at the end of which period every dead egg and fish must be carefully removed, or *Byssus* will be sure to appear and kill the eggs and fish wholesale. It takes about 48 hours for this scourge to appear, so by daily attention it can be kept away.

The young fry, or "alevins" are hatched with a yolk-sac attached to the abdomen. This sustains them without any other food until it all disappears by absorption, when the fish will swim freely about the box, and they are ready to be liberated. This period appears from local observation to be from 21 to 30 days. No food of any kind should be given them at any time. This can only be done by experienced and competent pisciculturists, and in the yolk-sac stage absolutely none is required, and they should be liberated directly all have lost the sac.

LIBERATING.

If it is desired to liberate the fry at the spot where the box is, it should be gently turned over when all the fry will escape at once. The best place to liberate however, as recommended by Mr. Chaplin, is in about three or four inches of water passing over a pebbly bed. Here they are able the better gradually to accommodate themselves to their surroundings, and are less liable to attacks of predatory native fish, and the pebbles provide just the kind of ready refuge they require, under which they soon select hiding places. To reach such a suitable place it will be necessary to carry the fry the fry in a bucket, but in no case, I am told, should this exceed a quarter of a mile. The bucket should be a third full of water with a wet cloth on the outside to keep it cool; the rocking in carrying sufficiently provides air to keep the water in a suitable condition. On reaching the liberating spot care has to be exercised, and on no account must the bucket be emptied straight away for the change of temperature between bucket and stream may be very great, and the fry may get a fatal shock. To counteract this take a cup and ladle out a cupful from the bucket replacing each one by one from the stream, until the required temperature is gained. When this is done, quietly immerse one side of the bucket and turn it over.

As far as my own experience goes, although I can hardly as yet claim success, I think results are sufficiently encouraging to go on, and I intend to persevere, as it seems all losses can be accounted for and are traceable to bad methods and inexperience, and they do not appear to point to unsuitability either in water or climate.

With regard to depredations of native fish on the liberated fry, I have it from the Hatchery at King William's Town that trout should prove themselves a match in cunning even for the Tiger fish, and that as they quickly take up each his own hiding place, from which they only move a few inches to feed until they feel their strength, and being most voracious fish themselves in all probability they will in turn devour the native fish, as I am assured they have done in several streams in Cape Colony.

RESULTS OF LAST FOUR YEARS' TRIALS IN GWEBI RIVER.

In 1907 I received 3,000 Brown Trout-ova from the Perie Hatchery, King Williams Town. These hatched out very well, but owing to the box floating in too much water it had to be drawn daily into still water near the bank and consequently many died. Avelins were strong and packed well up stream in the hatching box (a good sign).

One night we lost all but about 500, inexplicably, at the time. Two years later I discovered it was due to native fish about one to three inches in length which congregated beneath the box and sucked the avelins through the zinc perforations. All the losses were from these causes alone. Result: 60 strong fry turned down.

1908.—4,000 Ova arrived from same hatchery. Arrived in bad condition owing to delays in post and all died within about four days; Byssus fungus, owing to the delay, having got hold of the ova throughout the box they travelled in.

1909.—4,000 Brown Trout-ova from same hatchery. Arrived in fairly good condition and hatched out very well, but avelins looked weak and dropsical, and native fish, I found out, were responsible for the loss of hundreds one night. The stream also, a small tributary of the Gwebi, I found had not enough current to overcome the modifying effect of zinc bottom and consequently there was practically no current through the box, and the bottom of stream being muddy sediment settled in large quantities. Report of Perie Hatchery also stated that this particular year's supply of ova was not satisfactory, the cause assigned being that the stock of breeding fish at the Hatchery wanted new blood introduced.

1910.—With a view to trying different ova, and saving three days on the journey, I applied to the Government Trout Hatchery, Stellenbosch, and duly received 4,000 ova (3,000 Rainbow and 1,000 Brown Trout ova). Profiting by previous experience I wrote to the Hatchery previously as to putting gravel on the bottom of the hatching box to keep off native fish. I was advised that it was best to do without it, but that it would be a good thing to try in its place more wire of larger mesh under the bottom zinc. Gravel was sieved to the size of half a small pea and then well cleaned and finally boiled to kill all larvæ of any insect that might be amongst it. This was put half an inch deep all over the bottom and was found very effective, no fish being sucked down as far as I could ascertain.

The above ova arrived in splendid condition, only one dozen ova having to be removed. First 24 hours saw hundreds out which looked very healthy. Great trouble, however, was caused by the common flay or pennon-like weed one often sees adhering to rocks and floating like a green silk scarf under the water with the current. This, breaking off higher up, was continually being brought down in bits, and found its way daily into the box covering the newly hatched avelins. This weed, to a freely swimming fish, is not at all dangerous, but to these helpless creatures it meant a great loss from strangulation, for if they moved they got hopelessly tangled up in it. To stop its getting beyond control, the box had to be opened at least four times a day and the weeds removed from the bottom by means of a feather and a hair brush to pick it up with. While floating the box was kept pretty free, but this constant disturbance of their rest and the sun's rays too often and too long striking into the box during the operation, killed a large number. The result was eventually 600 very healthy fry liberated, and I feel sure that but for the weed nuisance a much larger percentage would have been successfully turned down.

I noticed that the Rainbow trout seemed to do far better than the Brown, and they get about much sooner, and even with the sac attached will make rushes about the box while the Brown Trout lie much longer inert.

The result from these four years seems quite encouraging, and with perseverance and better methods, trout breeding seems feasible.

PLACING OF HATCHING BOX:—GENERAL ADVICE.

Be sure and put the box in clear water about 1ft. 6in. deep, gravel bottom preferred, below a rapid, so that a strong stream strikes the box in front and thus allows a good current to be always passing through the box. Place well cleaned and sifted gravel the size of half a small pea, half inch deep over the bottom of the box. This will effectually stop native fish sucking the avelins through the zinc perforations.

Lose no time on receipt of ova in getting them safe into hatching box, floating ready. See that all dead eggs, fish, moss, etc., are cleaded out once in 24 hours. Use only a feather for moving eggs for examination. To remove dead fish use a small pair of forceps; eggs are best removed with a glass tube 1ft. long 3-16ths inside diameter. Hold thumb firmly on top, place tube over the egg and release thumb. The egg is immediately sucked up. Replace thumb and remove tube with egg inside.

Do not pull box about into still water, and keep off the sun's rays. This is best done by attending to the box early in the morning or evening. If liberating the fry some distance away from the box remove them from the box into a bucket by means of a small net, wire frame with mosquito netting sewn flat with very little "sag" in it is suitable. On reaching the desired spot bring the water down or up to the stream's temperature by ladling out a cup of water from bucket and then one from the stream into bucket.

Do not give avelins any food.

Release directly all the avelins have lost their yolk-sacs. Liberate in as shallow and gravelly a spot as possible, about three or four inches of water, with a good current is a suitable place.

The use of Lime in Agriculture.

By G. N. BLACKSHAW, B.Sc., F.C.S.,
Government Agricultural Chemist.

Before giving an account of the application of lime for agricultural purposes and a general description of its action upon soils, it may be well to briefly consider in the first place the relationship between those forms of lime of general importance from an agricultural standpoint. Lime occurs in nature in several states of combination; of these, the one used for "liming" soils is Calcium Carbonate or a product obtained therefrom by burning. Calcium Carbonate is the chief constituent of limestones and of deposits resulting from their disintegration, the percentage amount present therein being subject to considerable variation; of Rhodesian limestones so far examined in the Agricultural Laboratory the best sample contained 96 per centum, whilst some of the samples submitted as limestones contained less than 20 per centum. Several samples forwarded for analysis have proved to be Magnesian Limestones containing, in addition to a fair quantity of Calcium Carbonate, a large amount of Magnesium Carbonate, such limestones on account of their high magnesian content are not particularly well suited for agricultural purposes. The composition of several Rhodesian lime deposits is given in this number under "Notes from the Agricultural Laboratories."

During the process of lime burning the Calcium Carbonate contained in the limestone is decomposed by the heat generated into quicklime (calcium oxide) and carbonic acid gas, the latter escaping at the mouth of the kiln; the quicklime so obtained readily takes up water and falls to a very fine powder known as "Slaked Lime," and this in turn gradually combines with carbonic acid gas, contained in the air and in the products resulting from the decomposition of organic matter with which it comes in contact when applied to soils, to re-form Calcium Carbonate. In short, the following outline explains the relationship between Quicklime, Slaked Lime

and Calcium Carbonate (mild lime), the three forms most commonly made use of in agricultural practice :—

(a) Calcium Carbonate decomposes on burning into Quicklime and Carbonic Acid Gas.

(b) Quicklime readily takes up water, forming Slaked Lime.

(c) Slaked Lime gradually takes up Carbonic Acid Gas, at the ordinary temperature, forming Calcium Carbonate.

In order that we may determine whether the fertility of the soil is likely to be improved materially by an application of lime it is necessary that we should have some conception of its action thereon. Lime acts upon soils in many ways, of which the following are the more important.

LIME IS A DIRECT PLANT FOOD.—Calcium being an essential element of plant food, an application of lime may be of direct manurial value in that it augments the supply of this element in the soil ; most soils however, contain a sufficiency of available Calcium for plant food requirements, so that any improvement resulting from its application must as a rule be due to causes other than its action as a direct plant food.

PHYSICAL ACTION OF LIME.—In this respect lime has marked effect upon heavy soils, rendering them more open, more easily worked, and checking the tendency of such soils to cake and form into lumps ; the natural drainage is improved and a better tilth can be obtained.

LIME PREVENTS SOURNESS.—The sourness or acid condition of soils is due to lack of lime or other basic material in forms capable of neutralising acids produced by the decomposition of organic matter. Except in the neighbourhood of lime deposits, the lime content of Rhodesian soils, and in fact of South African soils in general, appears to be very low ; it may be asked what is an adequate percentage amount of lime for South African soils ? Hall, of Rothamsted, states that English soils containing less than one half per cent. of Calcium Carbonate benefit by the application of lime, whilst on land containing less than one fifth per cent. a lime dressing is a necessity ; some of our most fertile soils which have been under crop for some years, have never received manure and contain less than one-tenth per cent. of Calcium Carbonate, are still yielding in normal seasons over 3,000lbs of maize per acre. We must therefore

conclude that, whatever the minimum percentage of Calcium Carbonate permissible may be, the figure must be considerably lower than the English standard.

LIME PROMOTES ACTIVITY OF MICRO-ORGANISMS which convert the nitrogen existing in organic (vegetable) matter and ammonium compounds of the soil into available plant food. Three of the necessary conditions for the activity of these organisms are the presence of air in the soil, the absence of sourness, and a base to combine with the acid substances which they produce. Lime improves the natural drainage and aeration of a heavy soil, it prevents sourness and provides the necessary basic material. The important part played by micro-organisms in soil fertility has long been recognised, but it has been brought more forcibly to our notice by the recently published researches of Russell and Hutchinson, of the Rothamsted Experiment Station in England, into the cause of the increased fertility which results from heating the soil. The heating of soils to a temperature near to the boiling point of water has almost, if not quite, the same effect in improving their fertility as an application of manure; this, as a result of careful investigation, they attribute solely to the destruction, by the heat, of organisms present in the soil inimical to the bacteria which convert insoluble soil nitrogen into available plant food.

LIME RELEASES DORMANT PLANT FOOD IN THE SOIL, converting, more particularly, the potash present in insoluble forms into soluble and therefore available plant food, available potash being a constituent of plant food in which soils are liable to be deficient. Lime also prevents to some extent phosphoric oxide from becoming locked up in the soil as highly insoluble phosphates of iron and alumina.

LIME CONVERTS SOME PLANT POISONS TO HARMLESS COMPOUNDS.—As mentioned in the last issue of this *Journal* there is reason to believe that the infertility of some of our soils is due to the presence of poisonous iron salts; in such cases good drainage and the liberal application of lime constitute the best means of removing the trouble.

After consideration of the part played by lime in soil fertility it will be seen that stiff soils are most likely to derive the greatest benefit from a dressing of lime, particu-

larly those rich in organic matter; all soils however which contain a fair proportion of organic matter will as a rule benefit by its application.

The form of lime to apply depends to some extent upon the nature of the soil. Quicklime and freshly slaked lime are more suited for use on heavy soils than on those of a light character, the reason for this being that quicklime and slaked lime have a powerful action in promoting the decomposition of organic (vegetable) matter, the excessive loss of which is very detrimental in the case of light soils. Unburnt lime (Calcium Carbonate), which has been reduced to a fine condition is much milder in its action, and consequently on light soils the use of pulverised unburnt lime in one or other of its forms is to be preferred. In many parts of the Mazoe District deposits of travertine (commonly known as vleilime) containing over 80% of calcium carbonate have been found; dressings of this material if well pulverised should prove very beneficial on soils deficient in lime, care must however be taken that the material is thoroughly broken down before application, since lime in a fine powder is worth many times its weight of similar material in visible pieces. On heavy soils, quicklime and slaked lime are usually more effective than without lime. In England it was at one time the common practice to apply four to eight tons per acre, with long intervals between the applications, but this system is not to be recommended on account of the rapid decomposition of organic matter set up thereby; now-a-days more frequent application of lime in smaller doses has become the custom. Although no hard and fast rule can be laid down the amount generally applied is 500 to 1000 lbs. of quicklime (burnt lime), 700 to 1,500 lbs. of freshly slaked lime, or one to two tons of *finely powdered* unburnt lime per acre every five or six years, these amounts being adequate only when the material used is of good quality. If quicklime is applied, it should be placed on the land in small heaps previous to ploughing, covered with a little earth and left for a week or so to slake before spreading. Slaked lime and ground unburnt lime can be broadcasted over the land at once and ploughed under. On account of the possibility of turning the lime in too deeply by the above method, some prefer to apply the lime after ploughing and then harrow it in. If slaked lime is used, it should be covered immediately after spreading, as it has a tendency to cake on the surface if allowed to remain exposed to the air.

Farms and Farming in Rhodesia.

UMZINGWANE, MATOBOS, AND TULI-
MANZAMNYAMA.

By ERIC. A. NOBBS, Ph.D., B.Sc.

In considering the agricultural conditions of the four districts named above we must remember that we deal with a region extending from places which have always been the centre of population, both in barbarian as in recent civilised times, into parts which have ever been on the frontiers not only of nations but of human habitation, where the subject races formed a buffer between rival savage powers and between their human enemies and the hostile forces of untamed nature. Changed as are the conditions of today yet relatively the same differences remain between the oldest settled part and the confines of our territory.

Commencing immediately outside the town of Bulawayo, the Native District of Umzingwane includes the north eastern edge of the Matopos and the broad valleys that stretch between them and the Insiza hills. The district, an area of 691 square miles, extends from the watershed of the country down to Balla Balla, where it adjoins the districts of Gwanda and Belingwe. This part of the country is largely "land locked," owned by companies or by non-resident individuals who own properties without farming them, in hope of a rise in land values. The occupied farms are therefore few and far between. Owing to geological differences the farms vary much as regards soil, veld and water, while some are good a number also are distinctly the reverse. Around Heaney Junction and down the Gwanda Line to past Ophir Siding and in the Muligwane Hills gold-bearing schists occur, elsewhere we have granite furnishing for the most part light soils, sour and bare, but well watered, early and most suitable

for cattle rearing. The sedimentary and volcanic rocks have given rise to a much richer soil, especially in the valleys, where good aluvial stretches are to be found, such as those very fertile tracts on the farms of Messrs. Holl, Moudrey and Rorke. On the north east side of the Mligwane range of hills too there is a wide expanse of superior land, unoccupied. For general farming the best portion of this district is in the neighbourhood of Essexvale Station. Several tenants have at various times started to work on properties held by land companies, but this system is very rarely found to work satisfactorily owing to the speculative aims of the proprietary bodies and to the fact that in a new country the man who is content to become a tenant is rarely an enthusiastic farmer. This is borne out by the fact that in this locality there are several highly successful progressive farmers on their own land while the adjacent companies' blocks are vacant and unused, or were at one time stocked and are now abandoned.

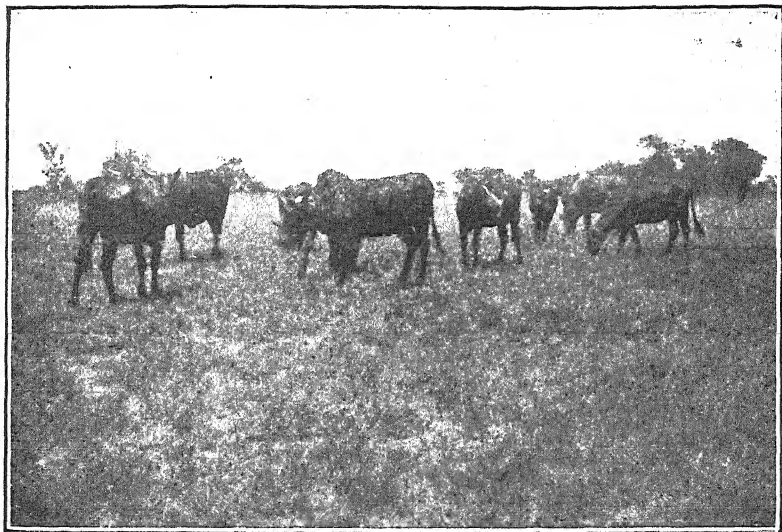
On the Springs, Colonel Napier, one of the Pioneer band, is farming on a large scale with cattle and crops. The farm is fenced and in good order, and has off hay only, yielded good returns to its owner. Another example is to be found on the adjoining farm Springvale, where Mr. H. P. Holl has done a lot of work and today, besides having large herds of cattle, grows over a thousand bags of mealies and has placed ground under irrigation enabling him to grow successfully lucerne, oats, wheat, potatoes and an orchard of citrus and other fruits. Mr. Holl stores his mealies, not in sacks, but in bulk in four great galvanised iron tanks under a thatched roof, but it is the land under the furrow that will yield the crops of greatest value and this area it is proposed to enlarge. Similarly Mr. M. Rorke, at Crocodile Valley, has 25 acres of first-class alluvial land under irrigation and the farm in good order in spite of the fact that twice he has lost all his cattle with Coast Fever, the second occasion being the commencement of the present outbreak which has given rise to so much anxiety throughout Matabeleland.

Nearer town the farms have been broken up into small holdings, while dairy farms naturally are found, supplying milk to Bulawayo. Such a farm is that of Mr. Dennis, Bellevue, where, for the cattle in winter a wide variety of fodder is grown: lucerne, teosinte, sugar cane, mangold and the like, while others are being experimentally tried.

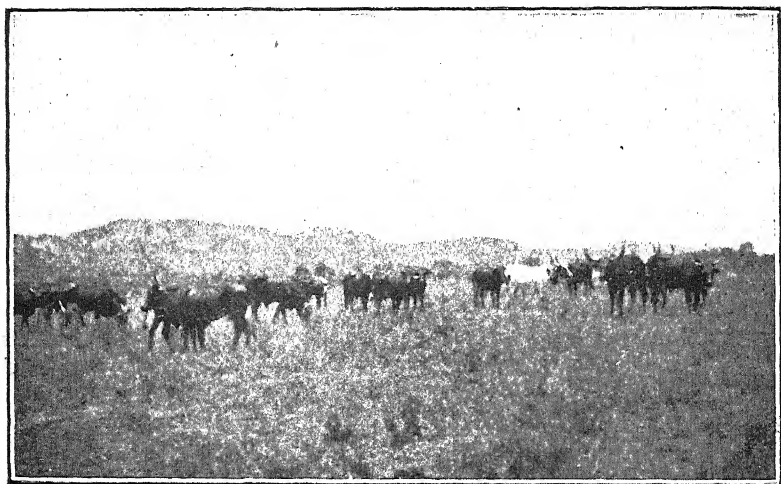
The total number of occupied farms in the district is few, only 22, while the blocks of land held by non-residents and the native reserves occupy a large proportion of the whole. Only approximate figures can be given, but the acreage of mealies last year may be put down at one thousand, breeding cattle at about 500 head, oxen at a little over 200, while horses are but very few. Owing to the presence of Coast Fever at a point in the centre of the district there is not likely to be much immediate expansion of farming operations during the coming season. In combating the disease fencing on an extensive scale has been resorted to, and advantage taken of a number of existing fences, so that today the district can boast more fencing than is generally to be found in Rhodesia, a network of over 150 miles.

Southwards along the railway line to West Nicholson is a stretch of poor country and the character of the landscape changes and scrub becomes more and more plentiful either in clumps or belts or in continuous masses, forming the bushveld which continues for a considerable distance across into Transvaal territory.

Advantage has been taken on the Hollins block of the presence of so much wood suitable for conversion into charcoal, and large quantities are made and sent up to the Bush Tick Mine for the suction gas plant in use there. This is an industry which may have a considerable future. Not only is a valuable and necessary fuel provided, but the clearing of the scrub is a benefit to the veld if it is properly carried out. This scrub consists of soft woods of but low growth quite incapable of developing into valuable logs. Much of the indigenous bush of the country not fit to provide mining timber or even fair firewood is yet admirably adapted for making into charcoal. The process is cheap and not too intricate to be mastered by anyone of ordinary capacity, whilst the product is readily saleable, more portable than wood, and not perishable. Provided the trees are cut off close to the ground, not breast high, as is the way of the untutored native, such trees as survive will send up healthy coppice shoots capable of striking roots and with all the vigour of the old tree's roots to force them into strong straight stems. Stumps three feet high are on the other hand apt to produce a pollard growth of weak switches which never produce such satisfactory re-growth as does proper coppice



*Crossbred shorthorn heifers imported from Cape Colony.
Owned by Mr. Bathurst, Malundi, Mopani*



Native-bred Makalaka cattle, the property of Mr. Lees, Alalie

while the protruding stumps encumber the ground. Proper clearing of the veld undoubtedly improves it for grazing purposes, whilst the preservation of belts as breakwinds and shelter is a simple matter. No doubt dwellers in the open parts of the country regard clearing of bush, except to make lands, as a species of vandalism, but in the bushveld charcoal burning offers a valuable method of preparing land for the reception of cattle and affords a solution of a problem which in many parts of Rhodesia confronts the pioneer.

The Matobos Native District is not dissimilar in many respects to Umzingwane. Although Bulawayo is on "formation," one very soon leaves this rock on the North and passes on to the granite of the Matopos region. At Fort Usher and in the Matopos Hills proper the soils are purely granitic and much of the area of 2,088 square miles is devoted for all time to the purposes of a public pleasure ground and to Native Reserves. Some noteworthy farms occur also in this neighbourhood. These usually, though not invariably, possess soils of both the red loam and the granitic sandy types and the character of the farming has been influenced by the proximity to markets.

Dairy farms find a ready market for butter, and for fresh milk or cream to be manufactured into butter at Bulawayo. Cutting the natural grass of the veld and making hay, baling it and selling it, is also considerably practised. Tobacco growing is receiving more and more attention, while the staple crop of mealies continues to be grown in larger and larger quantities. The country is essentially good for cattle and several farmers hold between two and three hundred head of breeding stock, while a few have more.

The Matobos district boasts half a hundred farmers. Many of these are newcomers, and acreages are uncertain, while stock changes hands with frequency. Hence any enumeration must necessarily be approximate, but the figures given are as accurate as under the circumstances it is possible to expect. There were about 1,800 acres of mealies grown last year with 120 acres of potatoes and 80 acres of ground nuts, a crop of which more is likely to be grown next year. The number of breeding cattle may be put down at 3,100, and oxen mostly used for draught purposes at 800, whilst farmers own about 50 horses or just about one each, many having to do without this luxury,

The most noteworthy farm is no doubt Westacre, where Mr. E. A. Hull has been resident a number of years. This is the farm on which the far-famed Matopos dam has been constructed and is often spoken of as Mr. Rhodes's farm. In addition to ordinary agricultural operations a certain amount of attention is, it is understood, bestowed upon experimental research of a practical nature, the results of which should one day be of much value to the Rhodesian farmer. Everything has been done to make the farm a success, and high class stock has consistently been kept. Lucerne is being laid down on a large scale and up to the present is giving most promising results. In order to keep the crop clean a special lucerne cultivator has been obtained, and with the help of this Mr. Hull feels confident that he will be able to avoid the too common fate of the lucerne being smothered out by weeds. Broadcast sowing has been followed and no pains have been spared in bringing the land to the finest possible state of cultivation before the seed is sown. These experiments will be watched with much interest since the generally accepted opinion is that where weeds are likely to be troublesome drilling in rows is preferable to broadcasting. Oat forage is also grown on a very large scale while potatoes, velvet beans and mangels take their place in the rotation. The main farm buildings are excellently arranged, giving a maximum housing accommodation, and are a model of their kind.

In the same vicinity Mr. C. J. Webb has been farming for a number of years on Longsdale, another of the farms belonging to the Rhodes Trustees. Here there is much of interest. Last year Mr. Webb grew 1,300 bags of mealies, a large quantity for that part of Matabeleland. The farm lies on the Matopos branch railway, and butter making is a leading feature, while a grinding mill provides mealie meal for the district and for mines at a considerable distance as well. Mr. Huntley on Lucydale, is another large owner of stock in the Matopos besides growing a considerable acreage of crops.

The Matopos Park is well deserving of a visit from all interested in forestry work, an enormous number of different exotic trees and shrubs have already been tested and seed of new sorts is continually being received. Many of these have proved unsuitable, while others have established their claim to be considered valuable timbers suitable for afforestation work in Rhodesia.

The park itself is delightfully picturesque, the road to the grave winds between lofty tree clad kopjes and presents a succession of most charming views of this rather unique type of scenery.

The Grave itself, the last resting place of Cecil J. Rhodes, is most impressive in its sombre grandeur and loneliness. The huge steep mass of granite, tree clad at the base but bare and frowning towards the summit, looks out over the sea of kopjes and dwalas of the Matopos Range. The whole setting of this glorious grave imparts to the visitor a feeling of awe, and sublimity and fitness as the last resting place of the founder who has left so fair a heritage to the British Empire and to us. At a little distance from the grave stands the Allan Wilson Memorial—lasting testimony to brave men who died as well as they fought to make Rhodesia a white man's country. Amongst the many items of interest at the park is the excellent museum collected through the untiring energies of Mr. W. E. Dowsett, curator of the Park. Particular prominence is given to native timbers which are here shewn cut and polished, under their native and botanical names. A fine collection of seed vessels is also shown on one of the tables while a herbarium of exotic and indigenous trees and plants is in the making.

The large paddock set apart for specimens of the various Rhodesian antelope and other game, is also of interest to those who are not already acquainted with these animals. Sable and roan antelope, waterbuck, giraffe, and several specimens of our rarer wild fauna are to be seen in this enclosure. Tree planting on the park has received a great deal of attention, but as this matter is dealt with in Mr. Sim's report on Forestry in Rhodesia and at length in Mr. Dowsett's periodical reports, it need not be discussed here.

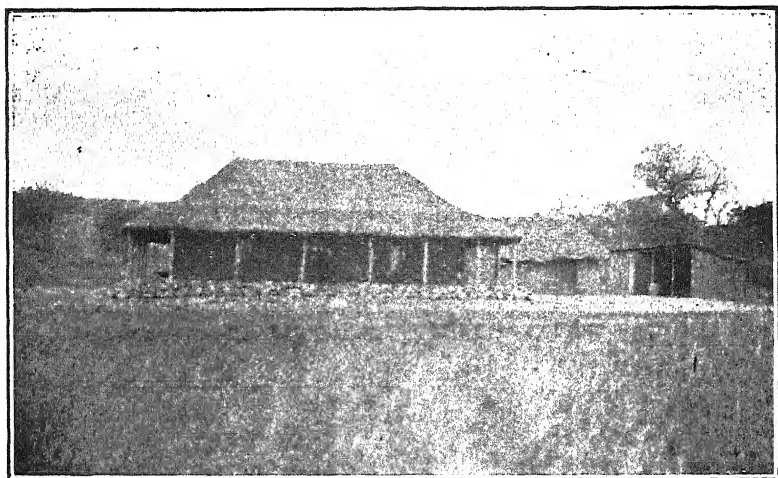
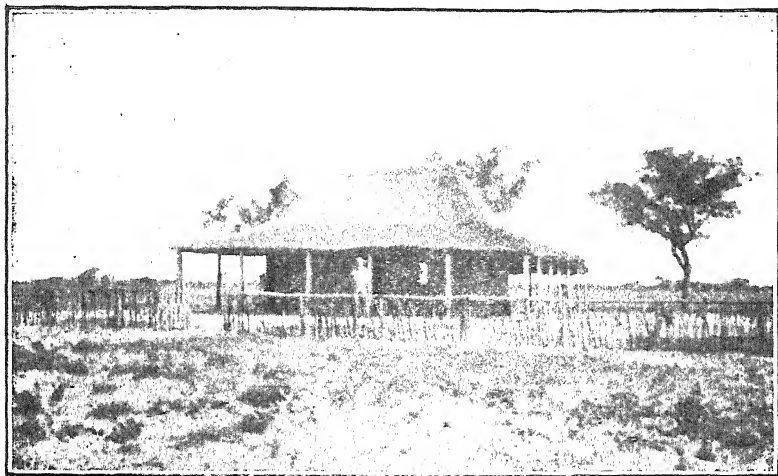
Looking westwards from the grave, enjoying, as was intended, "The World's View," the pilgrim tourist can hardly fail to notice signs of cultivation in a narrow valley, freshly turned soil and growing crops. This is on the farm Mineral King—a curious name—belonging to Mr. W. Savory, who has in the brief space of two seasons put a considerable extent of land under irrigation and is rapidly increasing this area, growing with the aid of manure heavy crops of potatoes, oats, mealies, tomatoes, and vegetables, and planting out

citrus groves, which are well calculated to prove a successful venture. The farm in situation and in confirmation is much of a surprise, the arable land lying in long narrow valleys amongst a turmoil of rugged kopjes, but possessing none the less attractive possibilities.

Towards its eastern side the Matobos District, still combining both granitic and formation soils, follows the watershed of the country and of the continent also, as far as Figtree, a station on the main line which derives its name from the historic spot, of which we give an illustration, at which in the old days travellers, missionaries, explorers, hunters and traders from the civilised South had to await the permission of the potentates of Matabeland, first Umziligazi, later Lobengula, before they might advance further into the country towards Bulawayo. The tree in question is an excellent specimen of *Ficus scabra* (?) a wild fig, and beneath it have waited most of the notable men who paved the way to Rhodesia long ago. This figtree is a well known landmark although the old road is now but seldom travelled, and the significance of the name is hardly realised by the hurrying travellers in the train to-day.

Not far from Figtree Station there are some farms of especial interest. At Vreigevecht South Mr. G. H. Wood is growing tobacco on a considerable scale, specialising indeed in that crop and growing mealies and other crops only for farm requirements. These are heavy however, for tobacco demands a large number of boys, picanins especially, as the work is not in itself heavy. There are three flue-curing barns and more must be built to meet the needs of the Virginian crop, which is the chief sort grown, only a few acres of Turkish being also put in. The farm is very favourably situated for its purposes, precisely on the contact of the sedimentary rocks with the granite, the combination which furnishes the best tobacco soils. On the neighbouring farm Mr. Walter White, of whose home we give an illustration, is engaged in developing this newly acquired property for mixed farming, and for raising high class cattle, especially his well known Afrikaner stock.

On the south side the Matopos terminate in a gigantic wall presenting to the eye a rugged outline, a long impressive panorama of bold precipices, the bare granite rocks rising

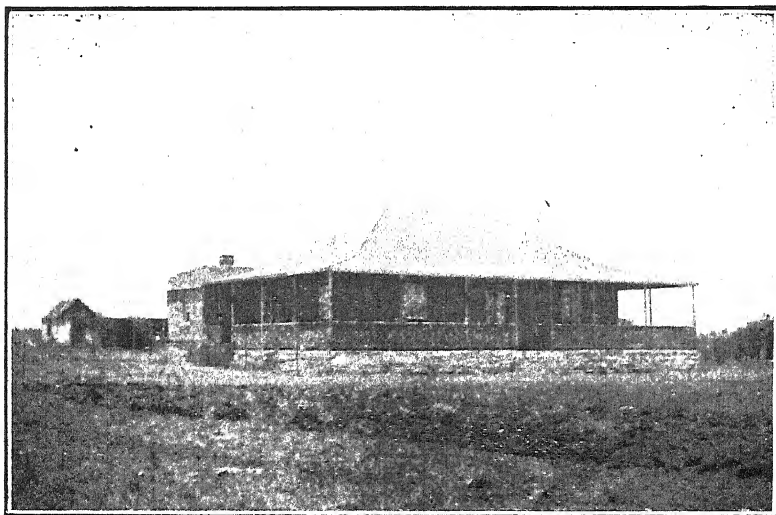
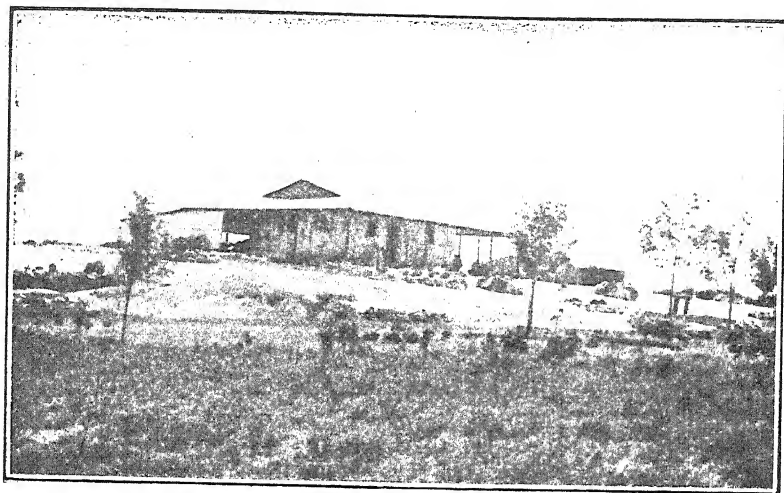


New Settlers Homesteads.

(1) Mr. Andrew Leslie's Kaya, Duta, Mopani.

(2) Mr. Stooles' granite house, Vimbi. Mopani.

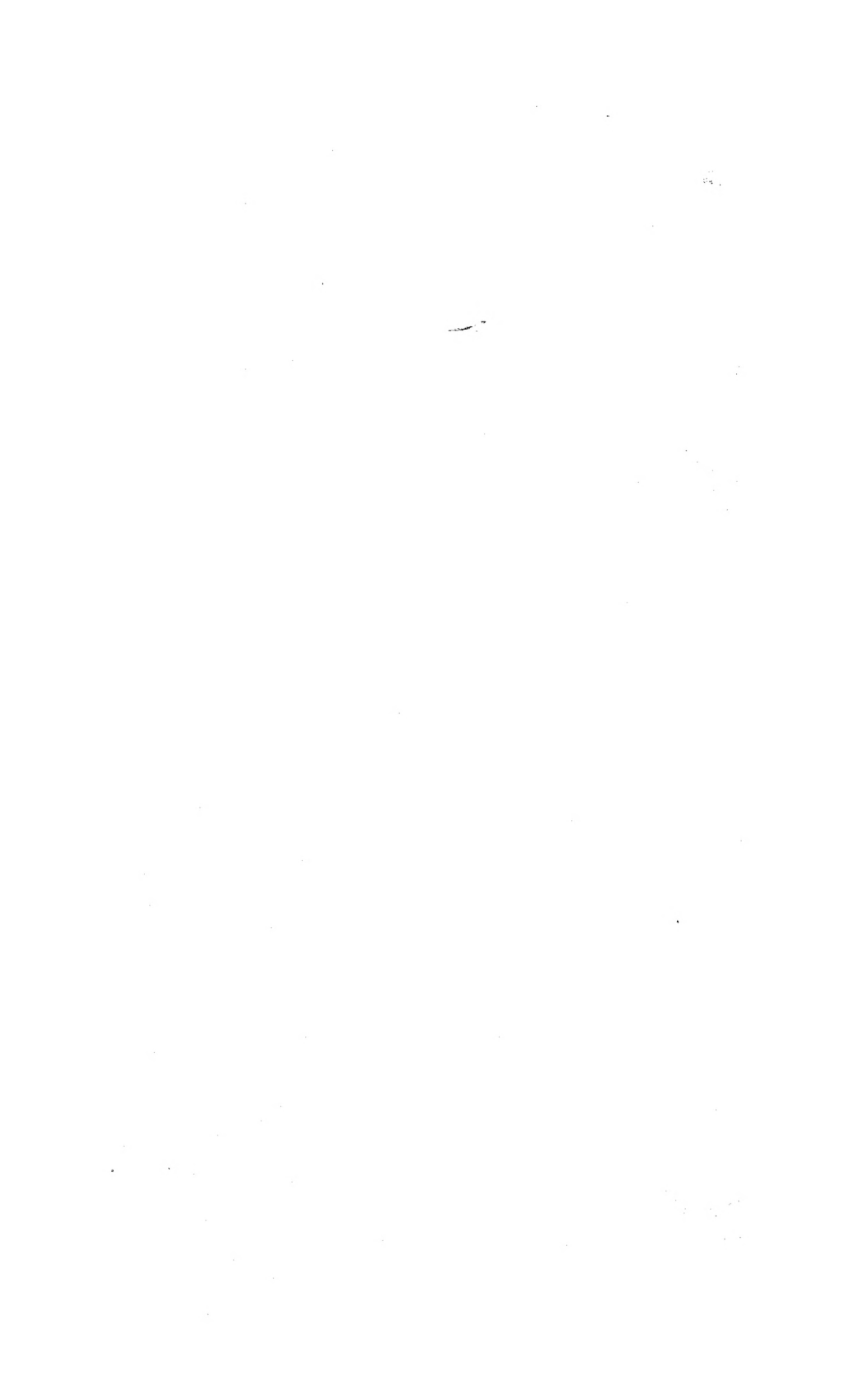




Old Settlers Homesteads.

(1) Mr. Lees' residence, Alalie, Mopani

(2) Mr. W. White's house, Vriegefecht, Figtree



to commanding heights at the Silosi Mountain and other peaks. From the edge of the Matopos a great plain stretches away south-east to Gwanda and south-west to the Antelope Mine, the monotony interrupted here and there with granite kopjes, and the verdure of bush and grass broken by dwalas, those curious smooth rounded outcrops of grey granite varying from the size of an anthep to that of small hills. A typical example is shewn in our illustration of native ploughing. This area is commonly spoken of as the Mopani on account of the prevalence of the tree of that name. These occur not uniformly but as the principal species, individually at first, then in belts, and in greater profusion and perfection of growth as one travels southwards, though generally mixed with other species, notably, sweet thorn. The Mopani veld is intersected by several good permanent streams—the Malundi, Ove, Maleme and Tuli Rivers, all take their rise in the Matopos and flowing ultimately into the last named, and so to the Limpopo River. Along these streams and their tributaries the best soil is found, and sweet veld, and between them on the rising ground greater or smaller expanses of sour veld with a relatively poor soil; as a rule very sandy, apt to dry out and covered with sparse scrub, but by no means to be despised as a cattle country. Water is here the chief factor to be considered, and the best farms are all those best supplied in this respect. Distance from drinking places is the only consideration in the grazing of cattle and the location of homesteads and kraals. Essentially the Mopani is good cattle veld, but even so is capable, without much difficulty, of great improvement and increase in its stock carrying capacity by the intelligent provision of winter feed—veld hay, stover, silage, roots, mangold, pumpkin and winter grass. Such country is best occupied in large blocks as ranching propositions with just sufficient cultivation for the purposes mentioned and for personal requirements. To remove continuously the best of the land in the form of mealies, veld hay and other crops direct, is more than such chemically poor soil should fairly be asked to do. On such land the output should take only the form of concentrated products like cheese and butter, meat and surplus livestock or the product in moderation of manured land, potatoes and the like. The aim of all farming here must be to increase the fertility of cultivated lands by manuring, by rotation and

tillage aimed at conserving moisture. The grazing powers of the veld must be improved by careful pasturing, by paddocking wherever possible, and so far as may be by avoiding, or only discreetly, burning the veld. Rather unfortunately, the great majority of the farmers of the Mopani, mostly settlers of recent date, are not in a position to take up the ultimately most profitable line of farming—cattle rearing; but are obliged by the arbitrary laws of circumstance to turn to whatever will yield an immediate return, with the result that they are growing light crops of mealies, groundnuts and potatoes, selling these at Bulawayo (a considerable distance off), to the Antelope Mine, or to the other mines in the direction of Gwanda. The number of stock in the hands of Europeans in the Mopani is singularly low and, except those of Mr. Ross, at Manyoni, and Messrs. Leith and Sturt, at Malema, of little account. Yet everywhere large herds of particularly fine Makalaka cattle owned by natives are to be found in good condition the year round and increasing rapidly. We give illustrations however of a herd of native bred cattle belonging to Mr. Lees, on Alalie, typical of the locally bred stock, and a bunch of cross-bred Shorthorn stock from Cape Colony, belonging to Mr. Bathurst, of Malundi, which, since their arrival more than a year ago, have done exceedingly well, without a single loss. This speaks well for the district which, for horned stock, can certainly be highly praised and recommended. The natives own many goats and sheep which do well, kept, as they are, in very small lots, often in the huts at night, but these methods hardly suit European ideas. Horse sickness is prevalent, with the result that while most Indunas and headmen own salted horses, the white man has to be content with a bicycle. Indeed, the natives of this part are very well off, not only on the philosophic grounds of lack of wants, but in actual material possessions. Formerly, the subjugated slaves of the Matabele, living for safety in the Matopos; these natives are now thriving and becoming rich under the changed conditions of today. They possess often hundreds of head of cattle, of which only oxen, and these at rare intervals, find their way into use either as trek or slaughter cattle. Increase in demands has not kept pace with increase in wealth, with the consequence that with an abundant local population farm labour is woefully scarce, particularly for

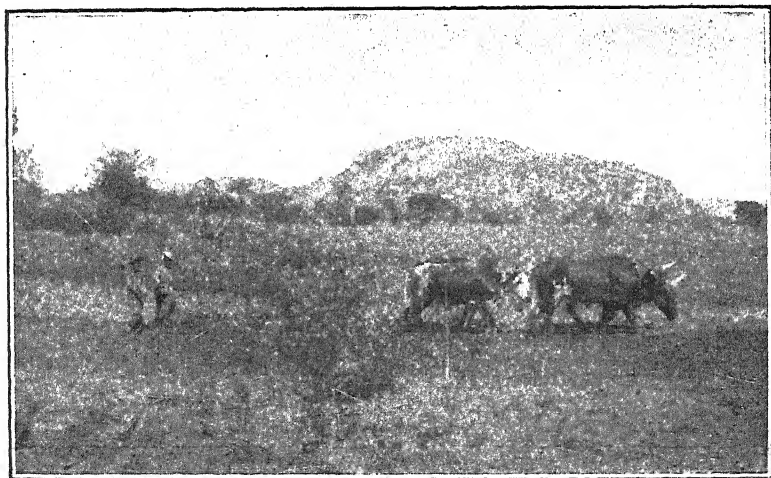
the newcomer, who is not yet known to nor knows the boys. The changes which the natives have undergone since the old days when they were fair game for the Matabele, with whom they are now largely intermixed, have been comparatively slight, mainly in their ideas of ownership of the cattle formerly held on behalf of the King. They now use ploughs, the old "seventy-five" and the "ninety-nine-and-a-half," although a good deal of hand cultivation by the women still obtains, and indeed the gentle sex is not exempt from assisting at the plough, holding the stilts and chirruping to the oxen whilst the men use the whip. A considerable number of farms in the Mopani have been taken up within the last two years and of those most are in process of being developed advantageously, although unfortunately several are in the hands of persons who occupy them by deputy, and in such instances the definition of the term "beneficial occupation" appears to be somewhat strained. Others are used as cattle posts for farmers resident nearer to railway and market, and this is a very fit and proper manner of turning the land to account and one for which it is eminently adapted. That farming operations can be successfully carried out in the much abused and wrongly condemned Mopani has been fully demonstrated by such instances as that of Mr. Lees who has farmed there successfully for years, and by Messrs. Leith and Sturt who have recently disposed of their farms to advantage and are going further out, deeper into the Mopani, to farm more particularly with cattle. Difficulties have had to be faced as is usually the case in newly occupied areas.

From the Malundi River to the Antelope Mine the country is Mopani veld. Around the Antelope there is a small area of formation on which the veld and trees usually associated with this type of rock are found. Around the mine the timber has been a good deal cut out. From the Antelope to Hwatalala's kraal good Mopani veld is found and stretches for a considerable distance on either side—every here and there vleis and glades occur giving the country a parklike appearance. Mr. Robinson is farming at Hwatalala where he has had a store for some years. Water is very scarce around here, and there is none on the road between the Antelope Mine, Hwatalala and the Tuli River. At Hwatalala one crosses a wide sand river in which the natives obtain water

by digging. Thence to the Tuli River the country is densely bushed, but in some places has been cut over.

South of the Matobos and Umzingwane Districts we reach Tuli-Manzanyama. Round the township of Gwanda lies an important mining area beyond which the country is for the most part granitic. Water is frequently scarce. As yet there are but few farms in this native district, which is of great extent covering 9,589 square miles. Some half a dozen farms are occupied only, but these find a ready market for mealies, charcoal, and for perishables like vegetables and butter on the surrounding mines. White farmers possess somewhat under a thousand cattle, natives fully ten times that number, while of small stock they hold over 25,000 head. The district is essentially good for stock and its future possibilities are very considerable. About six miles from Gwanda is Mr. Nicholl's farm where good possibilities for irrigation exist through the presence of a large dam constructed some years ago for supply water to an adjacent mine. Mr. Nicholl makes a speciality of growing vegetables for the surrounding mines and does so with great success. He is also charcoal burning for the mines. The farm has only been occupied for a short time. By the erection of a pumping plant a good irrigation scheme should become available.

Throughout Tuli-Manzanyama bushveld predominates, and towards the southern borders of Rhodesia adjoining Bechuanaland and the Transvaal the country is sparsely inhabited by natives, in addition to whom a very few traders may be met. To prevent possible running of cattle across the border a strip of country twenty miles wide and extending all along the frontier has been cleared of all cattle. This band stretches from Mphoeng's location on the Ramaquabane to the south-eastern corner where Rhodesia meets Mozambique territory. Stock found in this zone are shot forthwith. A corresponding belt ten miles wide has been provided on the Transvaal side of the Cracodite River, but not in Bechuanaland nor in the Tati Concession. The banks of the Shashi and Shashani and of the Tuli River down to a point within ten miles of Tuli are very rugged, and the country for some distance back from them rocky in the extreme. Fairly large timber is met with here, chiefly acacias and mopani, and the locality is famed as being the haunt of elephant and other large game. From



Native Cultivation.

The old way : Women burning and hoeing.
The new way ; Men ploughing.

15 miles below Tuli, down the Shashi and Crocodile for 35 miles there occurs a remarkable belt along the river front consisting entirely of the Malala, or vegetable ivory palm beneath which the grass is short and scanty. This tree is of economic use at present only on account of the alcoholic beverage its sap yields, to obtain which the natives tap the trees, destroying them in the process. Behind this belt northwards there extends a large tract of buffalo-grass veld with scattered mimosa thorn; rather scarce of water, except where such tributaries of the Crocodile as the Ipagi, Mzitashukwe and the Umzingwane rivers pass through it. Eastwards of the palm belt, down to the Malala Drift one meets mopani and mimosa, but beyond this point the country becomes very arid and rocky and wild in the extreme, continuing so throughout the district down to the Bughe River. In contradistinction to this forbidding part of the world there is splendid grazing country to be found, with rich black soil and splendid grass stretching from the neighbourhood of Gong's Poort for about 70 miles westward, including the areas lately taken up by the Liebig Company and the Elwes Block, and extending north and north-westward round the Jopempi Mountain and beyond the junction of the Umzingwane and Tjabesi rivers. This is rolling grass country, part open and part savannah of buffalo grass, mopani and mimosa thorn, sweet veld with ample water. Further up the Umzingwane round Tivuli and up to West Nicholson granite veld prevails.

From 15 miles from Gwanda to Tuli the road passes through practically great empty uninhabited spaces to Elephant Pits and the Golden Gate. The large black acacia and mopani are abundant, and a very extensive forest consisting of these, together with other trees, is found in the neighbourhood of Rietfontein; a great haunt of elephant, much frequented also by koodoo, impala and lions. Koodoo is found throughout these parts, and impala is specially common along the Shashi and Crocodile Rivers, indeed, this tract is often called the "Impala veld." The natives are principally Muvenda and Basuto,

Onion Growing.

By H. GODFREY MUNDY, Agriculturist and Botanist.

That the onion crop is one of no little importance to Southern Rhodesia may be gathered from a glance at the Customs returns for the years 1909 and 1910. During the former period 687,190 lbs. of onions valued at £2,753, were imported into Southern Rhodesia either from overseas or from other parts of South Africa, while for the year 1910 the value of onions imported during the first eight months — January - August — was approximately £1,500. Comparing the returns for the month of August in each year we find that the imports in 1910 are valued at £307, as against £257 in 1909, thus showing that the demand is fully maintained in spite of a possible increase in local production.

The output of certain crops, as many farmers know to their cost, already exceeds local demand, but in view of the above figures it would appear that a profitable opening exists for an increased production of onions. The stake is not a very large one but this is no reason why Rhodesian farmers should not divert some part of the above sum into their own pockets. Local growers have already proved that under favourable conditions the crop is extremely payable, and though up to the present the number of farmers who have attempted its cultivation is comparatively small, there appear good reasons for believing that onions might be grown far more widely both for market and for home consumption. The farm garden is a branch of rural economy which is too frequently neglected in Southern Rhodesia, but to most households a good supply of onions is almost as essential as are potatoes and on the average farm the onion patch should rank with the potato field or the orchard in importance.

There are two methods of growing onions, the older, is that of growing in situ and thinning out after the young plants are well established. This method still remains in favour

where the crop is grown on a very large scale but experiments have proved that heavier and more uniform returns can be obtained if the seed is first sown in beds and the young plants afterwards transplanted into the field. The former method is usually in vogue where onions are grown as a rain crop but in Southern Rhodesia experience has so far indicated that as a summer crop it is seldom entirely successful and growers as a rule therefore relegate it to the place of a winter crop under irrigation or without irrigation on naturally moist soil. It is true that the crop succeeds best under moderately cool conditions but further experiment is necessary before we can definitely say that it cannot be profitably grown during the rainy season, since it seems that in a few instances the seed has been sown during December and the bulbs ripened off successfully at the close of the rainy season. However this may be, it is for the present and is likely to remain, of greatest importance as a winter crop.

Choice of Soil.—On the suitability of the soil depends to a great measure the success of the crop. The onion is somewhat fastidious in this respect and if it is to be grown profitably large returns per acre, which cannot be obtained on unsuitable soils, must be forthcoming. Heavy clay or turf soils are undesirable, they are difficult to work and have a tendency to cake and crack unless continually cultivated. Moreover on such soils the bulbs do not ripen properly and there is a tendency to produce scallions. Excessively sandy soils lacking in humus (decayed vegetable matter) are also undesirable as are gravelly soils. The ideal onion soil is a rich deep friable loam containing an abundance of decomposed vegetable matter and such can be found in many parts of Southern Rhodesia. On the "formation area" the light alluvial loam or black mould soils will be most suitable while it has already been proved that many of the vleis on the granite veld composed of coarse and fine grained sand and containing large quantities of humus will, with the addition of manure produce good crops. In some cases these soils are likely to be insufficiently drained but since the onion is not deep rooted a simple system of shallow surface drains will in most cases be all that is required. If it is intended to grow the crop without irrigation and provided the soil is not actually water-logged these drains may be often safely dispensed with.

Preparation of the Soil.—For successful results a fine tilth is essential and no efforts must be spared in securing this. Newly broken ground is unsuitable and for autumn planting land ploughed at the beginning of the rains is desirable. It should then be cross-ploughed in January, and any kraal manure which has been applied should be lightly turned under. A disc harrow or heavy spike harrow should follow in order to work the soil to a fine tilth, and where irrigation is to be practised the land should be smoothed off and levelled by means of a plank harrow, light spike harrow or leveller. On some soils a third ploughing may be advisable.

Fertilizing.—The onion is a gross feeder and requires liberal supplies of plant food in a readily available form. The quantity and quality of manure necessary to produce profitable crops of potatoes will often not give even a moderate return from onions, unless assisted by a naturally fertile soil; and many of the failures which have been recorded may be attributed to lack of sufficient forcing by means of manures. The profits from a heavy crop of onions are usually extremely good, while the labour entailed is considerable whether for a heavy or for a light crop. It is therefore good policy for the onion grower to err on the side of being if anything too lavish with his manures, and as with other crops one acre done well will be more profitable than two acres scamped.

Farm-yard manure is the sheet anchor of the onion crop, and is essential on nearly all soils except those of an excessively peaty character, while even in such cases the use of well-rotted or short manure has been proved to be beneficial. On account of its more concentrated form chicken manure is desirable on excessively peaty ground, and pig manure also is highly valued. These, if well broken down, may be applied as a surface dressing and harrowed in just before planting the sets. Artificial fertilizers can also be used with advantage, and a complete dressing, namely, one containing nitrogen, phosphate and potash will usually be most satisfactory. Extremely heavy dressings of artificial manures are often applied to this crop, and in America a general dressing recommended is 200—300 lbs. nitrate of soda, applied in three or four equal dressings together with the same amount of muriate of potash and superphosphate applied shortly before the sets are planted out. Artificial fertilizers

are too costly in Southern Rhodesia to be applied on this scale, but where available a dressing of about two tons per acre of unleached wood ashes will assist in supplying the necessary potash salts, and will further tend to improve the mechanical condition of the soil and may well be combined with a surface dressing of fowl manure. The ashes should be harrowed in when preparing the land for planting. Seventy-five to a hundred pounds of double superphosphate per acre applied in the rows as is done for tobacco would be beneficial, and a top dressing of nitrate of soda or sulphate of ammonia at the rate of about a hundred pounds per acre, raked in after the sets are transplanted, would often be helpful in enabling the crop to better the attack of onion thrip where this is prevalent. When liberally manured in this manner, and provided insect pests can be kept in check, onions can frequently be grown on the same soil year after year with improved results.

Seed.—The vitality of onion seed is often defective, and several farmers report failure in their seed beds, which is probably more frequently due to indifferent seed than to defective methods of sowing. The seed should be of the best, and before purchasing the main supply, it is advisable to secure small samples from the seed merchants and to test these under artificial conditions. A hundred seeds taken from each sample and placed between damp sheets of blotting paper in a soup plate will in most cases prove a sufficient guide. The number of seeds which germinate within six to ten days will indicate the relative vitality of each sample, though it can hardly be expected that the same percentage will germinate in the seed bed where, in the majority of cases, the conditions for germination will not be so uniformly favourable.

The Seed Bed.—The seed beds should be made in soil as near as possible, similar to the ideal onion soil, namely, in a light vegetable loam. The young seedlings are sensitive to sunburn, and a light grass shade covering will usually be found beneficial. This thatching should be about eight to twelve inches above the surface of the beds, and, as the young plants gain in vigour, may be gradually removed until they are exposed to the full light and sun, and in this way become hardened off and ready for transplanting. Seed

should be sown from six weeks to two months before the date at which it is desired to commence planting out. It is usually found best to sow the seed in rows about three inches apart and covered to a depth of about half an inch. Frequent watering once or twice a day according to the character of the soil is necessary, but an excess of moisture should be avoided since this, coupled with screening from the full light tends to produce weak spindly plants. Broadcast sowing in the beds is often practiced but row-sowing will usually produce healthier plants.

When sown in rows at the above distance, about $1\frac{1}{4}$ ozs. of seed will plant a bed 6 x 3 feet and should produce upwards of 10,000 plants. To set an acre about 180,000 transplants will be used, so that to prepare transplants for this area about $1\frac{1}{2}$ lbs. of seed will be required and should be planted in a seed bed approximately three feet wide by 110 feet long or in similar proportion. The main object is to produce strong sturdy plants, and if germination in the rows is too thick the weaker seedlings should be thinned out.

Transplanting.—If seed has been planted in open seed beds protected with grass thatching the young plants should be ready for "setting" when about six to eight weeks old, or when the young onion is about $\frac{1}{4}$ to $\frac{1}{3}$ of an inch in diameter. When lifting from the seed bed it is advisable to cut off the green tops about half way down and to trim back some of the rootlets. The land having been previously marked off into drills 12 to 14 inches apart, the young plants are placed in the drills about three inches apart. The small bulb should be covered in the soil to a depth of about one inch. The rows are first laid off by means of a hand hoe or wooden marker—the furrow being made about two inches deep. Boys follow with the transplants, dropping them into the furrow at the necessary distance apart, while others follow and lightly cover the young bulbs.

Where irrigation is practised seed may be sown in the beds from March to April, and the young plants put out from May to July, and, provided an early kind is being grown the bulbs will be ripe and may be harvested in November, or earlier. When it is intended to grow the crop on naturally moist soil without irrigation it will generally be found advis-

able to plant out about the middle of April and to do this the seed beds should be established during the early part of February.

Cultivation.—If the land has been well prepared not much cultivation will be necessary except what is required to keep the surface soil loose and free from packing. Where small areas are being worked, this can best be done with a hand hoe, but the Planet Junior or Iron Age hand wheel-cultivator can often be used effectively. Local experience has gone to show that flat cultivation usually gives best results, but in some cases on ill drained land it may be better to slightly ridge the crop, and so facilitate drainage.

Irrigation.—If the crop is grown under irrigation two methods are applicable, namely flooding, or furrow irrigation. Where flooding is practised the onions should be planted in level beds which are banked up on all sides to confine the water. The land must first have been carefully levelled or, if the nature of the site requires it, terraced. Water can then be led into each bed in turn. This is probably the most economical method where water is scarce, as the overflow from the first bed can frequently be led on to the second and so forth. Furrow irrigation entails the land being on a slight slope, but not sufficiently so to cause the soil to wash. A shallow furrow is made between the rows of onions and the water is allowed to run down these, the strength of the supply determining how many furrows can be watered at the same time. The disadvantages of this practice are that the light soil suitable for onions is very liable to wash, and if the slope is at all steep a considerable proportion of the plants may be washed out or buried too deeply in silt.

Harvesting.—Ripening is indicated by the necks of the onions withering and beginning to turn yellow and this is shortly followed by the leaves and stalks falling over. The whole crop will not mature at exactly the same time but it is ready for lifting when the majority of the plants have reached this stage. The plants should then be pulled from the ground and those from every three or four drills should be collected together in one central windrow and there left to cure for a week or ten days. During this time the plants which were unripe when pulled will mature and the process

will be more thorough if the bulbs are carefully turned over once or twice. Rain falling on the crop at this period may cause a regrowth and harvesting should therefore be timed to precede the commencement of the rainy season. At all times when handling the crop, great care must be taken to avoid bruising the bulbs otherwise they will rapidly decay. Irrigation should cease as soon as the first signs of ripening are apparent failing which a regrowth may result. After curing, the tops should be cut or twisted off and the bulbs are then ready for storing or market.

Storing.—Even under the most favourable conditions the storing of onions is always likely to be attended with considerable loss and whenever possible therefore the crop should be disposed of as soon as lifted from the ground. Ill cured bulbs will sprout and bruised ones will go bad. Onions set aside to be stored must be thoroughly matured, well cured and free from bruises. The tops should not have been cut closer than one inch from the crown. In the store thorough ventilation and coolness are the two most important factors, and this might probably be obtained here by the use of grass-thatched sheds with racks composed of wire netting or crossed slats on which the layers of onions might be carefully placed to a depth of six inches or more. The great secret of storing lies in the proper maturing, curing, and careful handling of the bulbs; and failing this it is better not to attempt to store the crop, though by doing so improved prices could often be obtained.

Varieties.—The cultivation of the crop in Southern Rhodesia has, up to the present been too restricted to allow of a large number of varieties being tested. The red Natal onion, introduced by Messrs. Meikle Bros., appears to be among the most popular, and would be even more so were it not for its colour. Silver King is an onion of excellent appearance and medium early. It has given good results in several instances and is worthy of attention. Mr. Bruce Gray of Feira, North Western Rhodesia, is successfully growing a very handsome white onion possessed of excellent flavour and quality, which he believes to be of Bermuda origin. Yellow Danvers has been tested by some farmers but I have not heard of any success with it. It appears too slow to mature, though possibly it would be better suited for a summer crop. For

winter planting in Rhodesia it seems evident that an early or medium early variety is required,

Diseases.—The onion crop is heir to several diseases and is attacked by several pests, but by far the most important of these to us in Rhodesia is Onion Thrip.

The Downey Mildew is also occasionally troublesome, making its appearance in the form of a whitish looking powder on the leaves and stems, this however can usually be overcome by spraying with Bordeaux mixture. In countries where it is largely grown the crop suffers from several other diseases but these are not yet fortunately reported from Southern Rhodesia.

Production of Seed.—At present the crop is usually raised from imported seed but there seems reason to think that locally grown and acclimatised seed if sufficiently carefully selected would give even better results. Only thoroughly sound, well shaped and strong bulbs should be reserved for seed. These should be lifted from the field and planted in a nursery in a trench three to five inches deep and about six inches apart. To allow of cultivation the rows should be about $1\frac{1}{2}$ feet apart. The onions are usually planted as early in spring as possible and after the seed stalks are well "shot" the earth should be drawn around the bulbs in order to afford the necessary support. This should be done several times during the season finally leaving the plants on a ridge some six inches high. Towards ripening the plants should be left undisturbed and when the tops begin to turn yellow the heads with a few inches of stalk should be removed and placed under cover until dry enough for threshing. Ripening is always somewhat uneven and the crop will require to be gone over several times and the mature heads removed before they become too ripe and burst ; thereby shedding the seed.

The productions of onions may at times exceed local demands but owing to its wholesome nature the onion is an article of diet which at a reasonable price should find a ready market on the mines and the grower who is successful in storing his crop for a few weeks if necessary may generally rest assured of securing good prices.

Onion Thrips.

By RUPERT W. JACK, F.E.S., Government Entomologist.

During the dry season farmers in Southern Rhodesia who grow onions under irrigation have commonly to contend with the well-known pest, which goes under the name of Thrips. Applications for advice as to methods of protecting onion plants from attack have been frequently received at this office, and the following notes have been prepared with a view to making these methods known to farmers in general. This article makes no pretence to originality. The pest is common in other parts of the world and is treated in most works dealing with economic entomology.

The position of thrips in the class of insects has been the occasion of some difference of opinion amongst entomologists, but most agree in placing them under a separate order—Thysanoptera—thus giving them a position in nature equal to that of the great orders of Lepidoptera, Diptera, etc. This importance of position is due to the fact that whilst the various species of thrips resemble each other closely in form they differ considerably from all other insects. The mouth-parts are remarkable, exhibiting characters which suggest those of the biting insects on the one hand, and of the sucking insects on the other. (*See illustration*). It is probable, however, that they are mostly used for suction. Another remarkable feature is the structure of the feet which are provided at the extremity with a vesicle which can be inflated like a bladder. The Germans have a name for these insects which means "Bladder-foot," and the name Physopoda, which has the same meaning, is used by some authors to denote this order. Thrips are provided as a rule in the adult stage with two pairs of narrow wings fringed with long hairs. (*See illustration*). Some species, however, lack wings entirely. The young are more or less similar in form to the adults except for the absence of wings. (*See figure*).

Thrips are found in a variety of situations. Some species are very numerous in flowers. Others occur under the bark of trees or in similar situations. Others, like the onion thrip, infest the stems and leaves of plants. Some species are reported to be predaceous, but the majority live by sucking the juices of the plants on which they live. The onion thrip is a very minute insect, measuring in the adult stage barely one twentieth of an inch in length.

A field of onion badly infested with thrip presents a sickly yellow appearance, very different from the normal healthy green. This is due to the yellowing of the tissue where it is pierced by the insects. An examination of the affected plants will reveal the tiny insects about the bases of the leaves. They are mostly yellowish, this being the colour of the immature forms. The winged adults are of a darker hue. The yellowing of the tissue indicates its unhealthy condition, the assimilation of the plant is interfered with, and in bad cases the plant dies down altogether. Under certain circumstances whole plantings may be destroyed.

The adult female is provided with an ovipositor with which she slits the epidermis of the leaf or stem, and in this slit she deposits an egg. As already stated, the form of the young larvæ is more or less similar to that of the adult, the metamorphosis being described as incomplete in contrast to the complete metamorphosis of such insects as butterflies, moths, flies, etc., in which the young form is quite distinct from the adult. The larva moults several times in the course of its growth, and previous to becoming adult there is a quiescent stage, during which it takes no nourishment and which is analogous to the pupa or chrysalis stage of insects which undergo a complete metamorphosis. Under favourable conditions the thrip is reported to pass through a complete generation in three weeks.

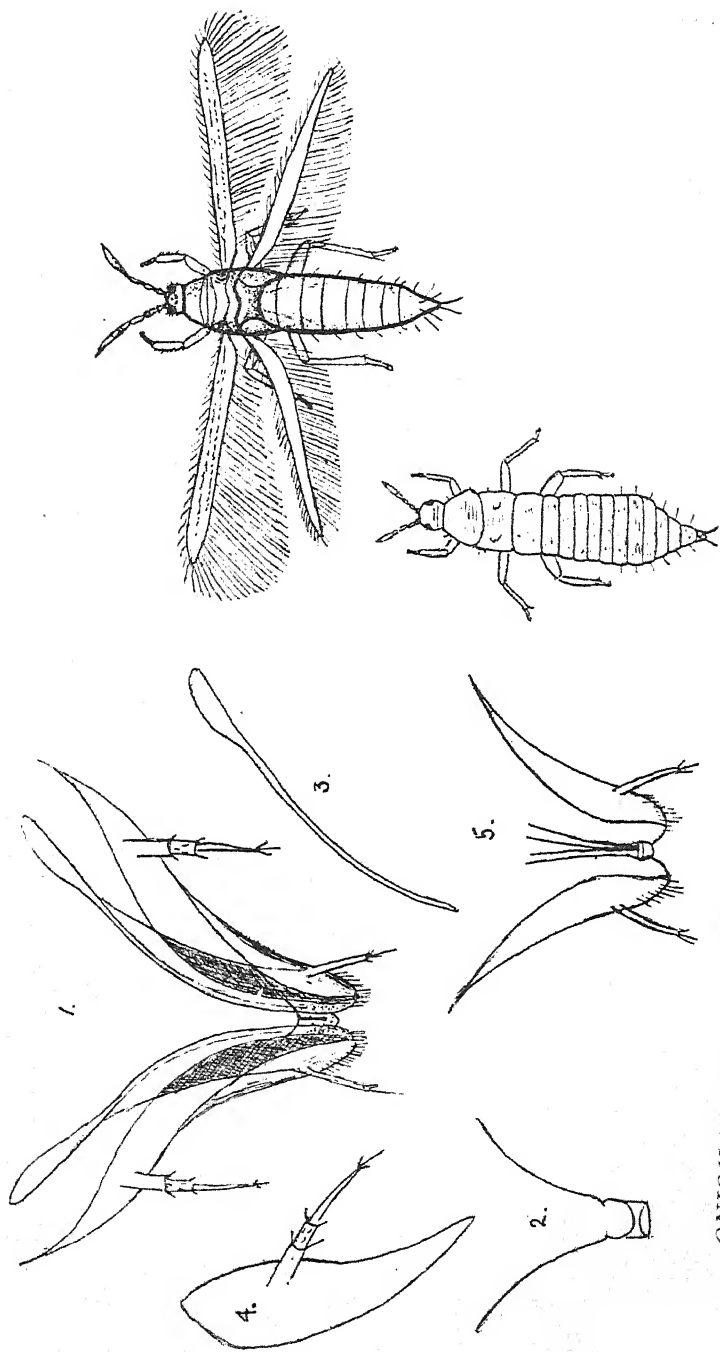
All the complaints of injury by onion thrip received at this office have been during the dry weather, from August to November. This agrees with the experience in North America, where they are reported to "thrive best in hot, dry weather, they become more dangerous as the plants are less able to resist them." (John B. Smith). Under these circumstances it is to be inferred that the trouble is likely to disappear with the advent of the rains.

The following list of food plants besides onions is given by Mr. J. H. Chittenden, of the United States Department of Agriculture. Injurious affected: Garden leek, celery, parsley, cabbage, melon, cucumber, squash (pumpkin), turnip, cauliflower and strawberry; more or less damaged, nasturtium, mignonette, carnations, candytuft, four o'clock and ruddbrekia. It is also probable that they are capable of feeding on certain wild plants and weeds.

The writer has no experience of the natural enemies of onion thrip in this country. The following are reported to attack thrip generally to some extent in other parts of the world:—Certain small bugs, certain beetles, a partially parasitic mite. Nematode worms have been found in the body cavity. Woodpeckers have been reported to eat thrips under the bark of trees. (Most of these observations are due to Uzel, Bohemia, and are recorded by David Sharp, Cambridge Natural History). In this country it is probable that onion thrip has certain enemies, but that they are under most circumstances quite ineffectual to control the pest is obvious.

Measures of prevention should aim at two points: firstly, to ensure that transplants are free from thrips or their eggs, and secondly to avoid infection in the field. To cleanse the transplants they may be dipped bodily before setting out in diluted Paraffin Emulsion, prepared as directed further on. It is possible that dipping the plants in tobacco wash would be equally, if not more, effectual. In the field the great point is *clean cultivation*. It must be borne in mind that the insect lives on other species of plants besides onions, and some common weed may be enabling it to breed in numbers ready to infest the onion plants when they appear. Sheltered conditions are reported to favour the pest and should therefore be avoided as much as possible. Anything which encourages the growth of the plants and promotes healthy development enables them to resist injury better, and measures to this end should be resorted to as much as possible.

Thrips are not the easiest of pests to destroy in the field, great thoroughness being required in the application of insecticides. When practicable, thorough drenching with water has been recommended as an effective check, but under the best conditions this is only applicable on a small scale. The



ONION THRIPS. (1) Mouthparts of thrips. (2) Labrum. (3) Mandible. (4) Maxilla. (5) Labium, after Culmstock. Full-grown larva and winged adult, greatly enlarged, after Howard.

best contact insecticide is reported to be paraffin emulsion. It is prepared as follows :

Soap	...	...	1 lb.
Paraffin Oil	...	(1 tin)	4 gallons
Water	...	...	60 gallons

Cut up the soap and boil until dissolved in two gallons of water. Remove from fire and immediately add to oil. Churn violently for fully five minutes if with pump, or ten to fifteen if with paddle. Dilute with remaining water. This should keep without separating in concentrated condition, and when made as directed—one part of emulsion to nine of water gives the proper dilution. For many aphides, twelve to fifteen parts of water is not too weak.

For thrips, the concentrated wash can be diluted fifteen to twenty times with water. Tobacco wash has long been known as a remedy for this pest, but in the past the chief difficulty has been to obtain a wash in which the quantity of nicotine can be relied upon. Tobacco leaves vary a great deal in this particular, even though they may be uniform in appearance, and different washes prepared with the same quantity of leaves may in one case be effectual in destroying a pest, and in another, practically useless. At the present time, however, there are several good brands of tobacco extract on the market, in which the quantity of nicotine is constant within reasonable limits, and thus the scope of tobacco wash as a reliable insecticide is greatly extended. Amongst others the following three brands can be relied upon:—Leaver's "Eagle" brand, McDougall's "Lion" brand, and "Arrow" brand. These extracts are usually put up in gallon tins. The preparation should be diluted with one hundred times its bulk in water, and the infested plants thoroughly sprayed at least twice with an interval of ten days. The best type of pump to use will be a knapsack sprayer, of which several makes are stocked by Rhodesian firms. A Bordeaux or other fan-shaped nozzle is superior to the cone-shaped for this class of work. With this pattern of pump the operator walks between the rows, spraying the plants as he goes along, and in this way covers the ground quickly, thoroughly and evenly. Some excellent results have been obtained by using tobacco extract in South Africa, and the writer is inclined to recommend its use strongly.

Plans and Specifications for Flue Curing Tobacco Barns.

Through the courtesy of the Director of Land Settlement and from experience gained at the Settlement Farm at Marandellas we are enabled to furnish the following particulars regarding the construction of flue curing barns for treating Virginian leaf according to the approved process for the production of bright tobacco.

Modification to suit particular cases will no doubt occur to those desirous of building barns to treat their leaf but the accompanying details will serve to indicate what may be regarded as a standard pattern of barn :—

Specification.—Clear the site of all rubbish and leave level. Dig the trenches for foundations 2 feet wide and 2 feet deep, or to such further depth as may be required to obtain a level and solid bottom. The sides of the trenches should be dug square. Build the foundations with the best stone procurable locally, in hammer dressed rubble set and bedded in good dagga, all well-bonded, and having no straight joints; no stones to have round faces, and no small stones to be used except where absolutely necessary for bringing surface up to true level. Foundations to be 2 feet wide by depth required by solid bottom, to finish no less than 6 inches above ground level at highest point. Flush up on completion and well ram the earth to foundations.

On top of finished foundations lay a damp and ant proof course of 2 to 1 cement mortar 1 inch thick, laid truly level, or zinc with 6 inch lap.

In every yard of face-work there must be at least one through stone and at all corners.

Build the walls 14 inches to a height of 4 feet above the foundations and the remainder in 9 inch work with good hard well-burnt bricks, well-bonded, set and bedded in 2 to 1

lime mortar or good clay dagga, all joints truly vertical and horizontal, every course well flushed up, and all outside joints to be raked out and painted in cement. No half-bricks to be used except where legitimately required for closers, all joints to be struck as the work proceeds. All crevices to be filled in.

The bricks for surface arch and the door and window arches must be rubbed down, and the latter arches must have a skew-back of not less than $4\frac{1}{2}$ inches. Build in all door, window and ventilating frames, all secured with hoop iron.

In a double barn the dividing wall must be carried up in a similar manner to gable ends. Do all beam filling.

Put a 3 to 1 cement mortar weathering to top of foundations.

Construct the roof, doors and windows as shown on plan.

Cover the roof with 24 gauge galvanized corrugated iron sheets 11 feet long each, free from corrosion or other defects. Iron to have a vertical lap of one and a half corrugations, to be secured to purlins with g.i. screws and g.i. and lead washers. Iron to fit close at ridge and against wall of lean-to-roof. Cover the ridge with 18 inch g.i. ridging fixed as specified to iron, and beaten down into corrugations of iron.

Put to the eaves $4\frac{1}{2}$ inches o.g., g.i. guttering fixed to fascias with proper bolts and tubes well soldered at joints. Put $3\frac{1}{2}$ inches diameter g.i. downspouts where marked R.W.P. on plan supplied, with proper bands and shoes.

QUANTITIES FOR SINGLE BARN:

Bricks ...	...	...	18,400 (say 20,000)
Corrugated Iron ...	...	...	20/11ft. sheets
Wall Plates ...	...	...	4/17 $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in.
Fascia ...	...	...	4/12, 2/18 6in. x $7/8$ flooring
Inside quartering for centre and wall uprights ...	...	...	5/20, 10/16 3in. x 2in.
Inside runners ...	...	...	15/16 $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in., 20/16 $1\frac{1}{2}$ in. x $1\frac{1}{4}$ in. (intermediate rails)
Roof Timbers ...	...	...	5/19 (Tie Beams), 15/11 (Rafters and struts) $4\frac{1}{2}$ in. x $1\frac{1}{2}$ ins.
Roof Purlins ...	...	...	6/19 3in. x $2\frac{1}{4}$ in.

Gable Ventilators ...	...	7/12 4½in. x 1½in., for framing.
do. ...	...	1/18 6in. x ⅞in. for panels
Lintels ...	...	1/12 4½in. x 3in.
Door Frames ...	...	1/15, 1/8 3in. x 3in.
Batten Doors ...	...	4/13 6in. x ⅞in.
Ground Ventilators ...	...	2/9 6in. x ⅞in., 3/12 2in. x 1½in., framing 1/10 3in. x 2¼in. for runners
T Hinges ...	...	2 pair, 18in.
Barrel Bolts ...	...	2 6in.
Screws and Washers ...	...	3 gross 2½in. screws
Nails ...	...	5lbs. 2in., 15lbs. 3in., 15lbs. 4in.
Ridging ...	...	5 lengths 18in. galvd. iron
Down Pipes ...	...	7 lengths 3½in.
Guttering ...	...	6 lengths 4in. half-round
Bolts and Nuts ...	...	105 lengths 5in. x ½in. for inside timbering
Cement... ..	...	4 casks
Pulleys for Ventilators ...	...	2 single, 2 double
Cord for Ventilators ...	...	100ft. ¼in.

QUANTITIES FOR DOUBLE BARN AND ONE PACKING HOUSE :

Bricks ...	...	56,000 (say 60,000)
Corrugated Iron ...	...	72/11ft. sheets
Wall Plates ...	...	20/16 4½in. x 1½in.
Fascias ...	...	4/12, 8/18 6in. x ⅞in. flooring
Inside Quartering for centre and wall uprights ...	...	10/20, 20/16 3in. x 2in.
Inside Runners ...	...	20/16 4½in. x 1½in.
do. ...	...	40/16 1½in. x 1¼in. (intermediate rails)
Roof Timbers ...	...	15/19 (tie beams), 30/11, 15/15 (rafters and struts) 4½. x 1½in.
Roof Purlins ...	...	430ft. 3in. x 2¼in.
Gable Ventilators ...	...	7/12 4½in. x 1½in. for framing
do. ...	...	1/18 6in. x ⅞in. for panels

Lintels ...	...	...	3 12, 1 18 4½in. x 3in.
Door Frames ...	...	...	3 15, 1 16 3in. x 3in.
Batten Doors ...	...	...	6 13, 12 8 6in. x 7⁄8in.
Ground Ventilators	...	...	4 12 2in. x 1½in., framing 2 12 6in. x 7⁄8in.
do.	...	...	13ft. 3in. x 2½in. for runners
T Hinges ...	...	...	5 pair, 18in.
Barrel Bolts ...	...	...	8 6in.
Windows ...	...	...	2 8in. x 10in., 12 light American stock
Screws and Washers	...	...	12 gross 2½in. screws
Nails ...	...	...	10lbs. 2in., 25lbs. 3in., 25lbs. 4in.
Ridging ...	...	...	16 lengths 18in. galvd. iron
Down Pipes ...	...	...	21 lengths 3½in.
Guttering ...	...	...	24 lengths 4in. half-round
Bolts and Nuts ...	...	...	210 5in. x ½in. for inside timbering
Cement...	...	...	16 casks
Pulleys for ventilators	...	...	2 single, 2 double
Cord for ventilators	...	...	100ft. ¼in.

QUANTITIES FOR FOUR BARNs AND
ONE PACKING HOUSE.

Bricks ...	...	...	83,400 (say 86,000)
Corrugated Iron ...	...	...	110/11 ft. sheets
Wall Plates ...	...	...	28/16, 4½in. x 1½in.
Fascia ...	...	...	4 12, 4 17, 4 18, 4 21, 6in. x 7⁄8in. flooring
Box Gutter ...	...	...	8 16, 6in. x 7⁄8in. flooring
do.	...	...	1 12ft, 3in x 1½in. for bearers
do.	...	...	4 lengths sheet zinc for apron
Inside quartering for centre and wall uprights	...	...	20 20, 40/16, 3in. x 2in.
Inside Runners ...	...	...	60/16, 4½in. x 1½in.; 80/16 1½in x 1¼in. (intermediate rails)
Roof Timbers ...	...	...	25/19 (tie beams)
do.	...	...	10/20, 30/11 (for rafters)
do.	...	...	5/20, 5/10 (struts)

Roof purlins	...	...	610ft., 3in. x $2\frac{1}{4}$ in.
Ventilators in Gables	...	...	7 12, $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in., for framing
do.	do.	...	1 18, 6in. x $\frac{7}{8}$ in flooring for panels
Lintels...	...	...	6 12, 1 18, $4\frac{1}{2}$ in. x 3in.
Door Frames	...	...	5 15. 3 9, 3in. x 3in.
Batten Doors	...	...	24 13, 12 8, 6 x $\frac{7}{8}$ in. flooring
Ground Ventilators	...	...	2 15, 6in. x $\frac{7}{8}$ in. flooring
do.	...	...	6 12 2in. x $1\frac{1}{2}$ in. framing
do.	...	...	20ft., 3in. x $2\frac{1}{4}$ in. for runners
T. Hinges	...	...	9 pairs, 18in.
Barrel Bolts	...	...	12, 6in.
Windows	...	...	2, 8in. x 10in. 12 light American stock
Screws and Washers	...	...	18 gross $2\frac{1}{2}$ in. screws
Nails	...	...	14lbs 2in, 40lbs 3in, 40lbs 4in
Ridging	...	...	24 lengths 18in. galv'd. iron
Down Pipes	...	...	35 lengths $3\frac{1}{2}$ in.
Guttering	...	...	36 lengths. 4in. half round
Bolts and Nuts	...	...	420 5in. x $\frac{1}{2}$ in. for inside timbering
Cement	...	...	24 casks
Pulleys for Ventilators	...	...	2 single and 2 double for gable, and 4 double for roof ventilators.
Roof Iron for Vents. in Roof...	2 10ft. sheets galv'd. iron.		
Framing for do.,	...	...	4 16 $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in.



Caravonica Cotton.

The attention of the Department of Agriculture has been drawn to the prospects of the cultivation of Caravonica Cotton in Southern Rhodesia.*

As serious consequences might follow rash embarkation on the venture of growing this crop we publish the following correspondence together with an authoritative article on the subject from the Agricultural Journal of India, the official organ of the Imperial Department of Agriculture in India, of July, 1910.

We may premise that young Caravonica trees are under observation in the grounds of the Agricultural Laboratories at Salisbury, while we understand that the plant was an entire failure in certain experiments made in the Northern Transvaal.

The accompanying correspondence and particulars are published without comment :—

*From S. A. Nathanson Commandite,
P.O. Box 261, Durban.*

To Agricultural Department (Salisbury).

23rd October, 1909.

Dear Sirs,—

We hereby beg to inform you that we secured the sole agency in South Africa for the Cotton Central Office (Caravonica Cotton Seed).

After many years' experiments by Dr. Thomatis, he succeeded in producing a cotton seed, second to none, and we guarantee that the cotton grown of this seed is of the finest quality so far known, and higher prices are paid for this cotton than for any other cotton in the market.

We, as representatives, bind ourselves to buy such cotton, or, if they prefer, to sell for them in Europe, any quantity, eventually at a fixed price for years to come.

We furthermore supply the Caravonica Cotton Seed free of charge in any quantities f.o.r. Durban on conditions as follows:—

- (1) Intending growers have to make application to us for Carvonica Seed, stating situation and size of farm.
- (2) Growers to obey our instructions re cultivating this cotton, and to allow us to inspect the cultivated ground any time we want to do so.

We, as representatives, to receive 5% of the out-turned crop either in cash or in cotton at option of growers.

We would ask you to make this very advantageous matter known to the various farmers in your Colony.

It is of the greatest importance to your Colony to have this commodity grown on a large scale.

Samples, necessary explanations, and any further information are at your disposal.

Yours very truly,

S. A. NATHANSON, COMMANDITE.

From the same.—To a farmer in Rhodesia.

Dear Sir,—

In answer to your favour of the 21st inst., we beg to enclose pamphlet on the cultivation of our famous Caravonica Tree cotton, and also two agreements on which we supply the genuine seeds free of charge.

The 5% mentioned in agreements are for exporting expenses, viz: packing, pressing, insurance, export duty, shipping, exchange on money for paying cash here, etc. We specially mention that because a few of our clients were under the impression that the 5% meant some payment for seeds, which however is not the case.

If you find soil and climate there suitable, of which we are almost sure, we advise you with clear conscience to go in

for as large an area as you possibly can, for there is no other produce that can give you so splendid returns as Caravonica, the finest of all cotton existing.

Please fill out and sign and return agreements at your earliest, that we may book for you sufficient seeds this season. The demand for Caravonica is greater than we expected this first season, and therefore are left with a limited quantity of seeds only.

Yours truly,

S. A. NATHANSON COMMANDITE.

AGREEMENT.

(One Shilling Stamp)

The following agreement has been signed to-day between :

The Baumwolle Aktien Gesellschaft, Berlin W. 15, Germany, their representatives, S. A. Nathanson Commandite, Durban, Natal, respectively, and Mr.....

1. The Baumwolle Aktien Gesellschaft hereby guarantee to supply Mr..... with genuine Caravonica Cotton Seed of Dr. Thomatis, free of charge, f.o.r., Durban, for the next sowing season, and Mr..... bind..... self..... to only use such seed for planting on acres of his/their farm.....

2. In return, Mr..... bind..... self..... for a period of ten (10) consecutive years, from date of his/their first Caravonica Cotton Crop (yield) to sell to S. A. Nathanson Commandite all his/their unginned Caravonica Cotton Crop (yield) at the current market price..... from which five per cent. (5%) shall be deducted. The price for fair unginned Peruvian Cotton to be understood the price for unginned Caravonica Cotton of fair average quality.

3. Mr..... bind..... self..... not to keep back or give away or sell Caravonica Cotton, ginned or unginned, or Caravonica Cotton Seed to any other party, unless so authorised by S. A. Nathanson Commandite, and Mr.....

also bind.....self..... to only sell or let his farm, the lands cultivated with Caravonica Cotton respectively, if the buyer or lessee enter into this agreement instead of Mr..... Of any eventual change (selling, letting, etc.) S. A. Nathanson Commandite shall be informed immediately.

4. The Baumwolle Aktien Gesellschaft or their representatives shall have the right to inspect at any time the lands cultivated with Caravonica Cotton.

Above read, agreed upon and signed this day of..... 191..... in the presence of the two undersigned witnesses, of whom one shall be a J.P. or Commissioner for Oaths.

Signature of Contractor :

Full Address of Contractor :

Signature of Witness :

(Name and address of Witness in plain writing).

Signature of Witness :

(Name and address of Witness in plain writing).

The following is the article referred to above, contributed by Mr. G. A. Gammie, F.L.S., Imperial Cotton Specialist to the *Agricultural Journal of India* :

Caravonica Cotton.

In the *Board of Trade Journal*, Vol. 66, No. 668 of the 16th September last, there is a short note on the experimental cultivation of Caravonica cotton in the Sudan. From this we learn that the agent of the Sudan at Cairo reports that it was decided to discontinue these experiments because the growth of the plants was not satisfactory, and the yield did not compare favourably with that from Egyptian cotton.

I have already dwelt on some experiences with this Cotton in India (*Agricultural Journal of India*, Vol. III, Part 3, page 271).

In order to demonstrate further the slender grounds on which are based the assumptions claimed for Caravonica cotton,

I shall shortly quote information gleaned from a perusal of articles contained in the *Indian Trade Journal* and *Tropical Agriculturist*.

From the former (September 30, 1909), we gather from reliable authority that, at the present time, there are several small growers of this cotton in the immediate vicinity of Cairns, one having some 10 acres planted out. There are three varieties, and the indications show that they are not constant in their characters, and that the young plants are liable to attack from insects. The article, which should be read in full by those interested in the matter, is indefinite on vital points, but the short abstract I have given serves as a useful commentary to what now follows. In the supplement to the *Tropical Agriculturist*, Vol. 32, New Series, No. 2, page 186, a long note on an interview with Dr. Thomatis can be found. He again avers that he established his hybrid cotton in the short space of five years. He attributed its failure in South India to unseasonable planting or unsuitable rainfall. In Queensland (he went on to say), where they have anything from 138 to 200 inches a year, the rainfall occurs during the four months, January to April, and the cropping conditions are excellent. He was only withheld from opening out land for his cotton on an enormous scale by the refusal of the Australian Government to allow the importation of some thousands of Indian coolies. In Lancashire his cotton is still considered to belong to a fancy kind and too fine for ordinary work. On the continent, however, it has been widely taken up, the silky kind being used for making all the fine classes of cotton and the woolly as a substitute for wool. In Berlin are the headquarters of a syndicate, called the International Cotton Company, with a capital of £6 or £7,000,000. This will lend money at 3 per cent. and provide seed, and the only restriction is that no seed must be sold or disposed of outside the Company, although the grower can do as he chooses about the sale of his cotton. Dr. Thomatis is advising Director to this Company, and he is now selecting land in German East Africa. He says that, already some 750,000 acres are under preparation to grow it in the Sudan. (We know that this statement is not accurate.) Sixty or seventy Norwegian families have migrated to Eastern Cuba expressly to grow Caravonica cotton, and they sailed in the "Fram," Nansen's ship of Arctic fame! He unfortunately

considers that perhaps Ceylon has not a climate quite suitable for growing Caravonica cotton. Caravonica is said to yield one ton (2,240 lbs.) to the acre, about 90 per cent. pure fibre being obtainable from a properly grown crop, against a minimum of 300 lbs. per acre with Egyptian.

In another issue of the *Tropical Agriculturist* we learn that a produce broker of Brisbane has evolved a hybrid "Mamara," which promises to be a serious rival to Caravonica. It has yielded at the rate of 300 lbs. of lint per acre, and a small crop is secured in six months after planting.

He who runs may read and form his own conclusions as to the merits or otherwise of Caravonica and other vaunted tree cottons. It is strange that the marvellous results proclaimed on their behalf have never been attained within our experience in India. Even in Australia where we have cast our mind's eye over boundless plains whitened with the overflowing harvest of Caravonica cotton, the bald truth is published that there are several small growers of this cotton in the immediate vicinity of Cairns!

To go no further than India itself, we have several instances of men, who, misled by paltry results obtained from carefully nursed plants in their own compounds, have persuaded complacent friends to waste their substance in attempting the hopeless task of tree cotton cultivation on a commercial scale.

The tree cotton which will succeed as a field crop has still to be discovered, and until it is really found and certified to be a success by responsible and disinterested men, the public in general will be well advised to withhold their financial support from well-meant, perhaps, but visionary schemes of amassing rapid fortunes from tree cotton cultivation.

Notes from the Agricultural Laboratories.

BOTANICAL.

HEAD SMUT OF MAIZE (*Sorosporium reilianum* Kuehn McAlp)
—The question of maize smut has already been discussed at some length in these notes in a previous issue of the *Agricultural Journal*. To Mr. McAlpine, Vegetable Pathologist to the Department of Agriculture, Victoria, belongs the credit of the recent research work on maize smut and the discovery that two forms of smut appear in that State, namely, American corn smut and what is now termed head smut of maize. The specimens submitted to this division for examination and which gave rise to the notes above referred to, were identified by the writer as infected with head smut (*Sorosporium reilianum*), and specimens subsequently obtained were sent to Mr. McAlpine who has kindly verified the determination.

As far as I am aware, *Sorosporium reilianum* has not been previously reported from South Africa and certainly not from Rhodesia. The determination is of some importance since in the case of American corn smut there is no known remedy except destruction of all infected plants and change of crop, whereas it has now been shewn that with head smut infection is carried by means of spores adhering to the grain, and that treatment of the grain with two per cent. solution of blue stone, or one pound of copper sulphate to five gallons of water proved an effective remedy. The grain should be immersed in the solution just sufficiently long to damp it, and should then be dried and planted forthwith.

Further information regarding these smuts is given on page 1530, Vol. VII, No. 6 of this journal, and is also printed in bulletin form which may be obtained free of charge on application.

UMKAUZANE (*Dichapetalum cymosum* Hook. Engl.).—About the middle of September a letter was received from Mr. C. J. Heurbly, of Bulawayo, enclosing a plant under the native name of Umkauzan, stating that he believes it to be very

poisonous to stock, and that it grows on the edge of the sandbelt and appears to like the same soil as the Mangwe or M'sasa trees (*Terminalia sericea*).

On examination the plant proved to be *Dichapetalum cymosum*, probably the most fatally poisonous plant in South Africa to farm stock. It occurs in the Bushveld of the Transvaal, in Bechuanaland, and has been previously reported from Rhodesia. The common names by which it is known are Gift-blaar, Gift-blad (poison leaf) and Makaou, and under one of these it will probably be familiar to many transport riders and others.

The plant is a small low-growing shrublet, seldom exceeding three to six inches in height, having a somewhat rhizomatous root system from which spring the short shoots bearing leaves about two to three inches long by one inch broad. The leaves are a similar shade of green on both sides, generally smooth, but sometimes slightly woolly, especially in the young growth, and are *alternate, not opposite to each other on the stems*. The flowers are small, greenish white in colour and powerfully fragrant.

Associated in habitat with Umkauzane is another plant, at first glance almost identical in appearance. Its native name is not known to me, but botanically it is known as *Padogia Zeyheri*. This is a harmless plant however, and can be distinguished from Umkauzane by the fact that *the leaves are opposite, in pairs or occasionally in threes and that the flowers are scentless*.

In habit of growth both plants somewhat resemble the dwarf Mabola (*Parinarium capense*), but the leaves of the latter are quite dissimilar, being whitish in colour, smooth above and densely woolly on the under side.

The poisonous properties of Umkauzane are at present receiving the attention of the Imperial Institute, South Kensington, and a recent report to the Transvaal Agricultural Department stated that the plant does not contain an appreciable amount of prussic acid as was at first supposed. Two resins, however, both having toxic properties, have been isolated and have proved poisonous to animals, and though

the investigations are by no means complete, a definite advance towards the discovery of an antidote has been made.

A feeding experiment was conducted with the present material by Mr. Bevan, Government Veterinary Bacteriologist, but unfortunately the subject (a six month's old lamb) died during the night within a few hours of the dose having been administered, and the symptoms could not therefore be recorded.

As with most of our poisonous plants, Umkauzan is most dangerous during the spring months, when, owing to its early growth, it presents a tempting green appearance before the natural veld grasses have sprung up.

The eradication of the plant is by no means easy on account of its extensive root system, but since it usually appears in well marked areas, it should be possible to eradicate it by continual ploughing or hoeing. Spraying with a 20% solution of arsenite of soda would probably destroy the plant, but as far as I am aware no test of this nature has yet been carried out. When isolated patches occur on a farm it is advisable to erect a ring fence around them, and in this way put an end to the danger once and for all. Failing these measures, farmers should ascertain the exact locality of the plants and take every precaution that their stock are precluded from grazing on that portion of the farm during those months when its succulent appearance may prove a temptation to hungry animals.

Animals having eaten this plant usually succumb before the evil is noticed and, therefore, before remedial measures can be applied. In cases however where the symptoms are apparent and where the animals are suspected of having fed on Umkauzan, it would be advisable to administer a strong purge followed by some stimulant such as "dop," black coffee, or vinegar and mustard. These are homely remedies, but, failing definite knowledge of the subject, are well worth trial. Indeed, Mr. L. Dechow, of Bulawayo, who has had considerable experience of this plant, writes as follows:—

"I saw a letter from your office referring to Umkauzan, saying that transport riders sometimes give mustard and

vinegar as a cure in cases of poisoning by this plant, but that you have no proof of its efficacy. I thought you might like to know it is undoubtedly a certain cure if taken in time. My reason for making this statement is that I have had considerably over a hundred of cattle down with Umkauzan and have never lost one that has been dosed with vinegar and mustard. I may add that it is hopeless if they get to water, and even after dosing they should be kept from water for ten hours."

Mr. Dechow has probably been fortunate in detecting the poisoning sufficiently early to permit of dosing with satisfactory results, or possibly owing to the age of the plants the amount of poison contained in the leaves was not excessive, but in the majority of cases the trouble is not noticed until the animal is past help.

H. G. M.

CHEMICAL.

SOME RHODESIA LIME FORMATIONS.

(A) Analyses of Limestones.

Laboratory No.	Locality (district)	Silica and refractory silicates. per cent.	Iron oxide and alumina. per cent.	Calcium carbonate. per cent.	Magnesium carbonate. per cent.
16a	Salisbury	0.64	0.61*	96.37	0.62
19a	do.	57.67	—	17.14	—
19b	do.	61.52	—	19.41	—
5	Gwanda	10.90	—	83.95	—
8	Lomag'di	—	—	54.23	43.26

* Also contains Ferrous carbonate 2.05 per cent.

No. 16a is a highly crystalline limestone of very good quality; it should produce, on careful burning, a lime similar to the white "fat" lime obtained from the Upper Chalks of the North Downs in England. It will yield an excellent lime for plastering, cyaniding and agricultural purposes.

Nos. 19a and 19b on account of their high content of silica and poorness in calcium carbonate are of little or no value.

No. 5 should, on burning, yield a lime almost equal to the "grey" or "thin" lime produced in England from the Lower Chalk, and largely used for building and agricultural purposes.

No. 8 is a magnesian limestone obtained from the Sinoia Caves. On account of its high magnesia content it is unsuitable for agricultural purposes.

(B) Analyses of Travertine (Vlei Lime), air-dried,
occurring in the Mazoe district.

Laboratory No.	Water. per cent.	Organic matter and water of combination. per cent.	Silica and refractory silicates. per cent.	Iron oxide and alumina. per cent.	Calcium carbonate. per cent.	Magnesium carbonate. per cent.	Total loss on ignition. per cent.
50	1.60	3.60	1.23	5.08	84.07	4.91	44.76
66	2.93		1.44	3.53	90.30	2.12	43.77
27	3.87		9.15		85.53	1.86	42.48
67	2.75		2.62		89.96	4.91	44.90
30	2.19		4.20		92.25	1.13	43.37
65	2.23		6.27		86.96	3.94	42.55
59	2.10		2.23		93.62	2.76	44.74
56	4.43		2.96		89.96	2.23	45.18
58	1.87		4.40		92.87	1.84	43.70
Av'ge	3.06		4.79		89.50	2.85	43.93

Large deposits of Travertine, popularly called "Vlei Lime" on account of its occurrence in vleis within a few feet, or inches in some cases, of the surface, have been found in many parts of the Mazoe district. The probable origin of the deposits, which are many acres in extent, and 10 feet or more in thickness, has not been thoroughly investigated. In one case at least there is strong evidence that it has been derived from the surrounding rocks near to the top of the Ironmask water-shed. No springs bearing calcium carbonate in solution being observed, one inclines to the view that the vlei at one time formed a natural basin in which water, carrying in solution carbonate of lime dissolved from the surrounding rocks, accumulated, the lime being subsequently deposited on evaporation. The deposits of travertine are of

fairly uniform composition, the average content of calcium carbonate present in nine samples being 89.5 per cent.; the proportion of magnesium carbonate present is somewhat higher than is the case in limestone commonly used for the production of agricultural and building lime in England, nevertheless the amount is not high enough to materially affect its suitability for either of these purposes, in fact limes produced from these deposits are already on the market and have proved to be very satisfactory for building, cyaniding and agricultural purposes. Regarding the use of *unburnt* travertine for agricultural purposes, reference is made in the article on "the use of Lime in Agriculture" appearing in this issue.

G. N. B.

ENTOMOLOGICAL.

CHAFER BEETLES.—At this time of year certain species of "chafer" beetles are very destructive to the foliage of some trees, and very particularly to grape vines and rose bushes. These beetles are of various sizes, and the prevailing colours are different shades of brown, but some are clothed in a livelier livery, such as green and yellow, black or brown and white, while some species even show bright metallic hues. "Chafer" beetles belong to a large family termed scientifically *Scarabaeidae*. They are vegetable feeders both as grubs and as beetles. In the former stage they live in the ground and devour the roots of plants. Such larvæ are known in some parts as "white grubs," and when present in numbers may do considerable damage to cereals or to the roots of grass. These "white grubs" were troublesome on a patch of experimental barley at the Agricultural Laboratory, Salisbury, last year. They devoured the roots to within an inch of the surface, and the plants quickly withered. At least 50 per cent. of the plants were lost in this way. The grubs are whitish and strongly curved, being unable voluntarily to assume a straight attitude. The three pairs of legs are conspicuous at the anterior end. The head is light brown and furnished with a strong pair of jaws. They are reported to take several years after hatching from the egg before changing to pupæ (chrysalides). In the adult stage they feed

greedily on the leaves of plants. They are nocturnal in their habits, hiding away during the day, and the injury to the plants they attack is the only indication of their presence. A lantern taken out on a favourable evening will, however, reveal them readily enough, sometimes flying round the trees in countless swarms and filling the air with their humming. Garden lovers are well aware of the damage they do and know how they can be caught by the light of a lantern whilst engaged in feeding. They drop to the ground at the slightest touch. They come very readily to light and some species are quite a nuisance from the way they invade lighted rooms when doors and windows are left open.

Various means of destroying the pest have been attempted, but the result is not always successful. As they come readily to light the use of trap lanterns would seem promising. A lantern is suspended near the surface of a tub of water and the beetles blunder against the glass and, falling into the water, are drowned. Usually, however, although large numbers of the beetles perish, this method does but little to check the damage to the trees. In a small way the injury can be mitigated in a garden by inverting an umbrella under the trees and jarring the beetles into it several times early each evening. The beetles as a rule are chiefly active at this time, not flying much after 9-30 p.m. This has frequently been exemplified to the writer when collecting insects with a lantern at night. "Chafers" would come in large numbers at first and then stop almost suddenly some time after nine o'clock. It is reported that at least some species of these beetles yield to arsenical sprays. It is not certain whether they are actually poisoned or whether the presence of the poison renders the foliage distasteful to them. Those who have reported success from the use of this preparation have in general not found the dead beetles, but merely found the trees immune from injury. From the numbers in which "chafers" occur it would seem that a remedy which relied on poisoning the beetles which ate the leaves would do but little to protect the trees. There would always be relays of the pest to continue the damage even though every one that fed perished. Whichever way it may act the remedy is worth a trial, and arsenate of lead at the rate of 1lb. to 16 gallons of water is recommended as the safest arsenical to use for this purpose.

CUTWORMS.—These troublesome pests are just beginning to make their presence felt in the tobacco seed beds and elsewhere. Poisoned bait has long been known as a remedy for cutworms, but the following modification of the old procedure is due to Mr. C. W. Mally, Entomologist for the For the Eastern Province of Cape Colony. Make a solution of—

Arsenite of Soda	...	...	1 lb.
Treacle or Brown Sugar	...	...	8 lbs.
Water	...	...	10 gallons

It may be mentioned that whilst arsenite of soda dissolves but slowly in cold water it is very readily soluble in boiling water, and in preparing the above it will save time to dissolve the 1 lb. of arsenite in a pint of boiling water and add it to the sugar or treacle solution. If there is any green stuff available on the farm it may be chopped up finely and moistened with the poisoned sweet. It should then be distributed broadcast over the land to be cleared of cutworms. If a seed bed is to be rid of the pest the surrounding ground may well be treated in addition. If greenstuff is not available, bran or mealie meal can be used. In the case of seed beds the bait should be distributed about the time of sowing the seed, and in the case of land which is to be used for the crop, about a week before it is planted out. If any damage commences, shewing that cutworms are still present, when the plants grow up or are planted out, the bait should be re-distributed. The ground surrounding the beds and the land generally should be kept clean of weeds, as these furnish the cutworms with food and so harbour the pest in the ground ready to attack the tobacco and other plants when they grow up, or are planted out, in which case they are the only food available and so suffer considerably. Clean cultivation is always a good insurance against pests.

R. W. J.

Reviews.

AFRICAN BLOODSUCKING FLIES. By ERNEST
EDWARD AUSTEN.

Issued by order of the Trustees of the British Museum.

This volume, published last year, has recently been received from the Trustees of the British Museum. Mr. Austen's name is well known in connection with his standard work, "A Monograph of the Tsetse Flies," which appeared in 1903. The present volume deals with the bloodsucking flies of Africa, other than tsetse flies and the mosquitoes. It is a highly seasonable publication at the present time when the bloodsucking Diptera are receiving so much attention from scientists, especially in Africa, and guides to the identification of the different species are greatly needed. The chief aim of the writer is to present accurate figures of the different species. The figures are very excellent, and the writer has relied largely on the skill of the artist to furnish the enquirer with the details of the flies to be identified, contenting himself with mentioning in the text such characters as may be necessary to differentiate closely allied species. To a large extent this end is attained, but as an enquirer one may perhaps venture to express the opinion that in spite of the accuracy of the figures, more detailed descriptions of the species would enhance the otherwise great value of the work. As with all the British Museum publications the printing, paper and binding are beyond reproach.

R.W.J.

THE ANNUAL REPORT OF THE S.A. CENTRAL LOCUST BUREAU.

Edited by C. P. LOUNSBURY, Govt. Entomologist, Cape.

The Fourth Annual Report of the Committee, representing all South African States, British, German and Portuguese,

charged with the important task of combatting locust plague, has been issued. It is of a gratifying and re-assuring nature

The scourge seems to have spent itself and virtually disappeared, partly owing to natural causes and partly owing to the active measures taken for its suppression. The Committee of Control is to be thanked for its earnest efforts, the simple record of which is contained in these four annual reports. Although the trouble seems past for the time being, it is now specially necessary that those concerned should be on the alert for the suppression of any swarms that may appear, however small or rare they may be, for they may prove the progenitors of future millions; and the public at large apt to be apathetic when the danger is not imminent and overwhelming.

We trust that for many years to come the reports may continue to convey the same tone of hopefulness and readiness for eventualities without the need of active operations.

E.A.N.

"AGRICULTURAL SOUTH AFRICAN, 1910."

Published by the Cape Times, Ltd., Cape Town, Sixpence.

We have received this most useful Annual, in which are brought together a number of papers on current rural topics by recognised authorities. Amongst the contributors are such names as Dr. Theiler, Mr. C. P. Lounsbury, Dr. Juritz, Professor Duerden, Messrs. Mally, James Woodin, J. Burt Davy and Noble Jack.

Dr. Theiler deals with African Coast Fever, and each of the other specialists with his own subject—soils, insects, ostriches, crops, irrigation and the like. There is much that is applicable to Rhodesia and two articles are devoted specially to this territory, one on the Future Development of the Farming Industry in Rhodesia, by Mr. R. C. Simmons, and one on the Prospects of Agricultural Expansion in Rhodesia, by Mr. G. M. Odum; with the general sentiments of both of which most men in this country will cordially agree.

We can confidently recommend this production to our readers.

E. A. N.

Cookery for the Country.

By L. C.

COLD CURRY

An excellent luncheon dish for hot weather.

Take $\frac{3}{4}$ lbs. of cold chicken, or of any other meat, and cut into large dice, removing all skin, gristle, etc. Then make 2 oz. of butter hot in a saucepan, chop two onions finely and fry a pale golden brown, then add half a cooking apple, chopped finely, and the meat, and stir for a few minutes. Mix smoothly a dessert spoonful of flour, two tablespoonfuls of curry powder, and one tablespoonful of dessicated cocoanut with half a pint of milk, adding the milk gradually to the dry ingredients; pour into the saucepan and stir the whole until it boils. Then allow it to simmer gently at the side of the fire for about an hour, and, lastly, add one teaspoonful of castor sugar, a little squeeze of lemon juice, and when the mixture has cooled a little, stir in half a gill of cream. Arrange in an entree dish a border of the following cold cooked vegetables—potatoes cut in quarters, sprigs of cauliflower, fancy shapes of beetroot and cucumber, quarters of small firm tomatoes, etc., all lightly dressed in the French fashion with oil and vinegar, pepper and salt only. When the curry is quite cold, put in the centre and serve.

MUSHROOMS AU GRATIN.

A Savory Lunch or Supper.

When mushrooms are in season, peel ten large cup mushrooms very carefully without breaking them. Cut out the stalks close down with a spoon and scoop out the inside of the cup. Peel the stalks and chop or mince them finely, and also the scooped-out part of the mushroom. Melt some butter in a frying pan and fry in it (about the size of a walnut) a onion finely chopped, a brimming teaspoonful of chopped parsley, and either a few twigs of fresh thyme or a

saltspoonful of dried thyme. When cooked, add sufficient fine dry breadcrumbs to make it all into a moist paste; season with a little pepper, salt and lemon juice, and fill each of the cups with the mixture, piling it up in the middle above the edge of the cup. Shake a few breadcrumbs over the top, pour a little melted butter into a baking tin, stand the cups in it and bake gently in the oven till the mushrooms are soft and tender, but take care not to cook them too much or they will break. Dish carefully with an egg-slice and garnish with some crisp fried parsley round the edge.

PUMKIN A LA PARMESANE.

Pumpkin, as a rule, is rather an insipid article of diet, but cooked in this way it will be found very savoury. Cut a large pumpkin into neat square blocks, boil for a quarter of an hour in salt and water, then take them out, drain, and fry until quite cooked in a stewpan with a little butter, salt, and grated nutmeg. Lastly, sprinkle them all over with a little Parmesan cheese; put them in a hot oven until the cheese begins to melt, then serve quickly.

POTATO CHEESE CAKE PUDDING.

$\frac{1}{4}$ lb butter; two fresh lemons (or oranges).

4 eggs; $\frac{1}{2}$ lb lump sugar.

Some cold mashed potatoes.

Rub off all the outside of the lemons on to the sugar, melt the butter in a pan and melt the sugar in it. When the sugar is thoroughly dissolved, squeeze in the juice of the two lemons, then add the mixture of the eggs, previously well whisked together in a basin and stir well. Lastly, add the cold mashed potatoes to the mixture and pour into a pie dish, which may be lined round the edge with a little puff-paste or not, as preferred, and bake in the oven until a nice brown. Serve hot or cold. It is generally preferred cold.

Agricultural Reports for September and October, 1910.

The winter wheat crop reaped in Enkeldoorn District has proved very satisfactory, the crop harvested in September amounting it is estimated to two thousand bags, although in the northern parts considerable damage was inflicted by frost early in the season. Wheat and oats are being increasingly grown under irrigation in that locality and with most satisfactory results. Winter oats have also done well in Mazoe but forage and other bulky crops await the advent of the railway.

Makwiro District is rapidly advancing and tobacco is here receiving particular attention. Two flue curing barns are in course of erection and some sixty acres are likely to be planted this season, quite a considerable area for a commencement in the case of such an exacting and intensively cultivated crop. Generally speaking, there is a prospect of a considerable extension of tobacco culture this season both by those who have grown it for some years and now feel justified in extending their operations and by a number of new hands whose efforts must necessarily be experimental at first and from whom one cannot look for the best results at once. From Melsetter comes word of a very favourable fruit season.

Natives commence ploughing on the softer soils in many districts as early as August, and cultivation of their gardens was general during September, a practice which while successful in the event of an early season leads in normal years to a need of resowing. European farmers without exception, having large areas to cultivate and working the soil to a greater depth, commence much later.

As in former years, too, the mischief caused by veld burning has been renewed and the steps taken to obviate it are very inadequate. The winter weather having been mild stock have suffered more from want of pasturage than from exposure, which is the more annoying as this is a preventable matter. A notable exception is the neighbourhood of Fort

Usher whence it is reported that owing to the care taken by farmers and natives jointly old grass was still plentiful and stock retained their condition late in the season.

Except where actual outbreaks of contagious disease have occurred stock is everywhere reported to be in good health and condition and increasing at a highly satisfactory rate. The arrangements made for the introduction of stock from beyond the Zambesi are now in force and several thousand head of cows, heifers and slaughter stock have passed through the quarantine area at Sipolilos coming from North-Eastern Rhodesia and Nyasaland, while oxen only are permitted by the North-Western Rhodesian Authorities to be exported to this Territory entering at the Victoria Falls and being quarantined at Ngamo or Matetsi. Towards the end of the dry season as usual the condition of stock falls off somewhat and losses from poison, from poverty and in calving are reported, though to no very serious extent.

At Gwelo a recent sale of over 300 cattle of every description was characterised by very high prices. Slaughter oxen made up to £16 5s., Mashona heifers not even in calf found anxious buyers at £10 10s, and old Mashona cows in calf up to £14 10s. Two spans trek oxen brought £10 per head. Almost all purchases were for local account—about 40 head going to Gatooma.

From August on the labour supply annually suffers a reduction owing to the fact that many boys return home having earned sufficient money for their requirements to enjoy the duly fermented fruits of the earth and of their kraal's labours of last year in the attractive form of Kaffir beer. From all accounts this beverage and its consequences have been very abundantly in evidence as a result of two consecutive good crops. The local male population also returns, to take its share in the preparation of the lands. This ebb of the labour supply in August is not so severely felt on account of the demand on the farms being also lowest at that time, but with the approach of the planting season the dearth of available labour becomes very inconvenient and sensibly decreases the extent of planting which might be undertaken, especially by the newer settlers who can least afford to be without boys.

The months of August and September were remarkable for depredations by lions. From Mrewa District it is reported that during August forty sheep and goats were killed by leopards at one kraal while lions accounted for seven head of cattle and numerous pigs. In Gutu fourteen head of cattle and sixteen small stock were killed by lions, ten head of cattle in Inyanga, three in Ndanga and several in Tuli Hartley and at Makwiro. In almost all instances it is native stock that is taken owing to their ineffectual kraal fences and gross carelessness. Another remarkable case is that of Mr. M. Rorke, of Crocodile Valley, Essexvale, on whose farm a hailstorm devastated his flocks, doing but little injury elsewhere but killing sixty seven of his sheep besides incidentally destroying, owing to the sudden chill, all the fish in the river and two duyker, three reed buck and two pythons! His loss is the more to be deplored as this is the farm on which an outbreak of Coast Fever occurred necessitating the destruction of all his cattle.

Correspondence.

HEREFORD CATTLE.

To Editor, *Agricultural Journal*,
Salisbury.

Sir,

On looking through the Article on Hereford Cattle in the October number it would appear that the photos. of the bulls facing pages 69 and 72 were of different animals. I should like to point out that they are all of one and the same animal. The first (page 69) was taken a few days after his arrival in Rhodesia in 1908, the second on top of page 72 was taken some 11 months later, while the photo. at bottom of page 72 was taken last August or when he had been 2 years and 3 months in the country. From these photos. there appears to be no doubt of the breed doing well in Rhodesia.

Yours truly,

R. GRANGER,

Veterinary Report for September and October, 1910.

SEPTEMBER.

SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks occurred. On the 5th September the remainder of the cattle on the infected farm Stamford, were destroyed and buried.

GLANDERS.—In testing animals which had been in contact with the glandered horse destroyed at the Eldorado Mine, Lomagundi, during the previous month, two horses reacted in the stable in Salisbury from which the animal was purchased, and were destroyed. Two mules gave suspicious reactions and were detained for further tests, about ten days later, however, one of them developed visible symptoms of glanders, and both were destroyed.

BULAWAYO.

AFRICAN COAST FEVER.—A fresh outbreak occurred on the Copthall Block in a troop of cattle belonging to the Matabele Reefs and Estates Company. The cattle were at once moved to a temperature camp on clean veld. The mortality to end of month was two from disease and eight destroyed on rise of temperature.

This outbreak is undoubtedly due to infection spread by the oxen from Crocodile Valley. It will be remembered that shortly before the outbreak at Crocodile Valley, some oxen were removed from there to the Limes Mine, which is on the Copthall Block. Three oxen showed symptoms of sickness and were shot by the owner, and the remainder moved back by the Department to Crocodile Valley.

The removal of all cattle from the vicinity of the infected farm, Crocodile Farm, is still proceeding, and satisfactory progress is being made with the fencing.

GLANDERS.—The following animals were tested with Mallein on importation and found free from glanders :—

Horses	...	...	35
Mules	...	...	33
Donkeys	...	...	126

INYANGA.

AFRICAN COAST FEVER.—Early in September some cases of what was thought to be gall-sickness occurred at the Rhodes Estate, Inyanga. At the request of the manager, a Government Veterinary Surgeon was sent to investigate. On arrival he diagnosed African Coast Fever, and microscopic examination of blood smears proved the diagnosis to be correct.

Prior to this outbreak the last case of disease recorded in the district was in March, 1906. The outbreak was confined to the draught oxen, the bulls and a few head of breeding cattle at the homestead, and as far as it is known the infected area is all within the fences. Fortunately the large herd of breeding cattle was several miles distant. It is most unfortunate though, that several valuable pedigree bulls contracted the disease and died. The cattle concerned were placed in a temperature camp. To the end of the month thirteen deaths from disease had occurred and fifteen animals had been destroyed on showing a rise of temperature. Prior to the diagnosis of the disease at the Rhodes Estate, a bull and fifteen heifers were moved from the estate to the farm Diana, Rusapi District. The bull was drawn from the infected paddock, and on arrival at Diana it was showing slight signs of illness. It died a week later, and although the cause of death was not definitely diagnosed, there is little doubt that it was Coast Fever. As soon as the bull was noticed sick the owner removed all the cattle to a distant portion of the farm.

The origin of infection in this outbreak is so far inexplicable. The nearest infected area is Baradza, in the Umtali District, but no case of disease has occurred there, so far as is known, for at least eighteen months.

INSIZA.

GLANDERS.—An outbreak of glanders occurred, and two animals showing visible symptoms were destroyed. All in-contact animals were tested with Mallein and proved healthy.

UMTALL

No contagious diseases reported. The test of the area at Baradza, formerly infected with African Coast Fever, is proceeding satisfactorily.

No contagious disease reported from any of the remaining districts.

OCTOBER.

SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks.

GLANDERS.—An outbreak occurred amongst a lot of mules received from the stables where the disease was discovered in September. One animal died, one was destroyed; the remainder were tested with mallein, one reacted and was destroyed.

All the animals in the stable in which the September outbreak occurred were again tested, two horses reacted and were destroyed.

BULAWAYO.

AFRICAN COAST FEVER.—Fresh outbreaks occurred at two native kraals on the Copthall Block, and the animals were removed to a temperature camp on clean veld.

GLANDERS.—The following animals were tested with Mallein on importation, and found healthy:—

Horses	...	...	49
Mules	...	...	85
Donkeys	...	...	105

INYANGA.

AFRICAN COAST FEVER.—Two bulls died at the homestead on the Rhodes Estate. The balance of the infected herd were removed to clean veld, remaining healthy.

A fresh outbreak occurred amongst a small lot of cattle on the Inyanga-Rusapi road about twelve miles from the Estate. Two animals were destroyed on showing a rise of temperature and the remainder moved to clean veld.

RUSAPI DISTRICT

AFRICAN COAST FEVER.—On the 6th October an ox in a span belonging to St. Trias Hill Mission, died from African Coast Fever. This span was quarantined two miles from Rusapi, on the Inyanga Road, when the first case occurred at the Rhodes Estate. Six were subsequently destroyed on showing a rise of temperature, and the balance were slaughtered.

On the 20th a beast died at the Mission Farm from Coast Fever, and at the end of the month seven had been destroyed on rise of temperature.

No disease reported from any other districts.

J. M. SINCLAIR,

Chief Veterinary Surgeon



Weather Bureau.

Temperatures Recorded, 1910. (Means).

				SEPTEMBER.		OCTOBER.	
				Max.	Min.	Max.	Min.
Bulawayo	...	...	...	80.2	52.2	...	...
Chishawasha	...	...	...	80.0	48.6	80.2	55.4
Empandeni	...	...	...	83.4	51.4	82.7	57.6
Gwelo ...	...	...	...	79.7	49.0	80.8	55.4
Hope Fountain	...	...	...	80.1	51.9	79.7	56.8
Melsetter	...	...	...	72.1	...	72.1	...
Plumtree	...	...	...	80.7	54.3	...	...
Salisbury	...	...	...	79.5	49.6	80.0	55.0
Umtali	...	...	...	80.3	33.0	80.0	35.0
Belingwe	...	...	...	...	...	...	...
Gwanda	...	...	...	...	...	...	...
Matopo Park	...	...	...	81.5	52.4	80.0	58.5
Selukwe	...	...	...	...	...	...	...
Tuli ...	...	...	...	86.2	65.0	85.0	...
Victoria	...	...	...	80.1	50.3	78.9	58.8
York Farm, Inyanga	...	...	...	71.8	46.6	73.4	52.7
Victoria Falls	...	...	...	86.9	52.3	93.4	64.3
Hartley	...	...	...	85.2	51.1	...	...
Shamva Mine	...	...	...	82.5	58.2	83.7	63.6
Giant Mine, Gadzema	...	...	...	83.7	57.1	85.9	63.1
Sinoia	...	...	...	85.6	50.5	82.1	57.2
Kariyangwe	...	...	...	87.0	70.6	...	...
Mount Silinda	...	...	...	...	...	75.2	55.9

Records received of Rainfall at Stations in Southern Rhodesia, 1910.

				September	October
MASHONALAND—					
Brundret, Mazoe	...	...	...	nil	2.03
Battlefields ...	...	...	...	—	—
Banket Junction	...	...	...	nil	—
Borrowdale...	...	...	...	—	—
Charter (Range)	...	...	...	nil	1.47

RAINFALL—*continued.*

	September	October
MASHONALAND—continued—		
Chilimanzi ...	nil	2.85
Chipinga ...	nil	—
Chishawasha ...	nil	3.12
Chicongas Location ...	nil	1.71
Driefontein ...	nil	1.47
Eldorado ...	.15	—
Enkeldoorn ...	nil	.50
Eagles Nest ...	nil	3.47
Gadzema, Giant Mine ...	nil	1.39
Gatooma ...	nil	3.16
Gutu ...	nil	.95
Grassfell ...	2.32	7.40
Hartley ...	nil	2.07
Hallingbury ...	nil	1.19
Helvetia ...	.66	2.92
Inyanga (B.S.A.P.) ...	.08	1.30
Inyanga (York Farm) ...	.37	2.09
Kanyemba ...	nil	.23
Lone Cow Estate ...	nil	3.75
Marendella ...	nil	2.17
Monte Cassino ...	nil	4.29
Macheke ...	nil	4.21
Mount Darwin ...	nil	1.75
Mount Selinda ...	—	1.38
M'Rewa ...	—	3.72
Melsetter ...	.42	2.16
Makwiro ...	—	2.42
Mazoe South ...	nil	2.07
M'Toko ...	nil	1.22
Morgenstern ...	.28	1.51
Rusapi ...	.04	2.44
Salisbury ...	nil	4.21
Sinoia ...	nil	2.33
Sipolilo ...	nil	3.94
Stapleford ...	—	—
Shamva Mine ...	—	2.68
Summerfield ...	.36	3.36
Utopia ...	.87	2.50
Umtali ...	.27	2.01
Victoria ...	nil	1.22
Vermont ...	nil	3.77
West Ridge ...	nil	.03

RAINFALL—*continued.*

	September	October
MATABELELAND—		
Balla Balla	nil	2.45
Bembezi	nil	1.83
Bulawayo (Observatory) ...	nil	.93
Bulawayo (Govt. House) ...	nil	.57
Belingwe	—	—
Empandeni	nil	1.01
Filabusi	nil	3.51
Fort Rixon	nil	3.01
Gwelo	nil	.90
Gwanda	nil	4.80
Gwaai	nil	1.52
Heaney Junction	nil	1.48
Hope Fountain	nil	1.80
Inyati	nil	2.96
Insiza	nil	1.53
Kariyangwe	nil	—
Malindi	nil	—
Maxim Hill	nil	2.17
Marula	nil	2.38
Matopo Mission	nil	2.40
Nyamandhlovu	nil	3.95
Plumtree	nil	—
Que Que	nil	1.29
Matopo Park	nil	2.18
Ringstead Reef	—	1.55
Selukwe	1.16	1.77
Shawlands	nil	1.32
Syringa	nil	4.63
Solusi ... ..	.01	1.86
Tegwani	nil	—
Tuli	nil	.67
Umguza	nil	2.23
Umshabetsi Mission	nil	2.86
Victoria Falls	nil	3.77
West Nicholson	nil	2.20
Wankies	nil	3.93

Market Reports.

According to the last advice received the London Markets are extremely quiet and there has been a slight fall in the prices of wheat and maize.

The Local Market is abundantly supplied with mealies, and all other produce come to a very strong market, especially in regard to beans and monkey nuts for Native diet. The new season's potatoes are coming in and a fall in the price is anticipated within a week.

The following are the latest market quotations received:—

Jas. Lawrence & Co. (Transvaal), Ltd., 17th Nov., 1910:—

Barley, per 150 lbs. ...	10/-	11/-	Peas, per 200 lbs. ...	16 6	16 9
Beans, per 200 lbs. ...	16 0	25 0	Potatoes, per 150 lbs. ...	6 6	16 0
Bran, per 100 lbs. ...	6 0	7 0	Rye, per 200 lbs. ...	11 0	
Chaff, per 100 lbs. ...	2 3	2 6	Salt, per 200 lbs. ...	4 0	4 6
Forage (T'vaal), 100 lbs. ...	3 0	5 6	Boer Meal, sifted, per 200 lbs. ...	21 0	24 0
" (O.R.C.) "	5 0	5 9	Wheat, per 200 lbs. ...	16 0	21 0
" (Colonial) "	6 3	6 9	Butter, per lb. ...	10d.	1 3
Hay, per bale ...	1 0	1 9	Eggs, per dozen ...	9d.	10½d
Kaffir Corn, White, per 200 lbs. ...	10 0	11 0	Ducks, each ...	2 8	3 0
do. Mixed ...	10 8	11 3	Fowls, each ...	2 2	3 0
Lucerne, per 100 lbs. ...	4 9	6 3	Geese, each ...	4 6	5 3
Manna, per 100 lbs. ...	4 6	5 0	Turkeys, each ...	6 0	15 0
Mealies, (S.A.), White, per 200 lbs. ...	6 9	7 4	Pigeons, each ...	7d	9d
Mealies, (S.A.), Yellow, per 200 lbs. ...	8 0	8 3	Slaughter Oxen ...	£9	£17 5
Oats, per 150 lbs. ...	10 6	11 6	Sheep, each ...	12 0	25 6
Onions, per 120 lbs. ...	10 0	25 0	Pigs, per lb. ...	2½d	4d

Jas. Lawrence & Co., Ltd., Kimberley, 11th Nov., 1910:—

Bran, per bag 100 lbs ...	6 0	6 6	Potatoes, O.R.C. ...	9 0	14 0
Barley, per bag 163 lbs ...	9 6	12 6	Potatoes, new ...	10 0	16 0
Beans, Sugar, bag 203 lbs ...	26 6	30 6	Tobacco, good, per lb ...	4d	7d
Beans, Kafir, 203 lbs ...	25 0	27 6	Tobacco, inferior, per lb ...	1d	2d
Chaff, Colonial, bale ...	7 6	10 6	Wheat, per bag 203 lbs ...	19 6	21 6
Chaff, Colonial, pressed, 100 lbs ...	3 0	3 6	Butter, fresh, per lb ...	1 6	2 0
Forage, good, per 100 lbs ...	5 3	5 6	Butter, second quality ...	1 0	1 3
Kafir Corn, S.A., mixed ...	12 6	14 6	Eggs, per dozen ...	8d	10d
Kafir Corn, White ...	12 6	14 6	Ducks, each ...	2 6	3 3
Boer Meal, Colonial, unsifted ...	23 6	26 6	Fowls, each ...	1 9	2 6
Boer Meal, Colonial, sifted ...	26 0	28 6	Turkeys, each ...	3 6	10 6
Flour, Colonial, per bag 100 lbs ...	15 6	16 6	Salt, per bag ...	3 0	4 0
Yellow Mealies, Colonial, 203 lbs. ...	8 6	9 6	Dried Peaches, per lb. ...		6d
White Mealies, Colonial, hard, 203 lbs ...	8 0	8 6	Dried Apricots " ...		6d
White Mealie Meal, 183 lbs ...	8 9	9 6	Lime, per bag ...	3 0	4 0
Oats, per bag 150 lbs ...	10 0	10 6	Naartjes, per 100 ...	2 6	5 0
Lucerne Hay, per 100 lbs ...	5 3	5 6	Pineapples, per doz ...	1 0	2 0
Onions, per bag 120 lbs ...	22 0	27 6	Oranges, per 100 ...	2 6	7 6
Potatoes, Colonial, 163 lbs ...	6 0	11 0	Strawberries, per box ...	3 0	4 6
			Beans, green, per lot ...	4d	9d
			Cabbages, per dozen ...	6d	3 6
			Cauliflowers, per doz ...	1 0	6 0
			Pumpkins, per doz ...	4 0	12 0
			Peas, per lot ...	3d	9d

SLAUGHTER.

Cows, good, 450 lbs upwards ...	£7 10	£9	Lambs, 30 lb ...	8 0	10 0
Calves ...	£2	£3 10	Hamels, 40 lb to 45 lb ...	14 0	17 0
Oxen, good, prime, 600 lbs upwards ...	£10 10	£13 10	Kapaters, good, 65 lb ...	14 0	18 0
Oxen, medium ...	£8 10	£9 10	Horses Riding & Draught ...	£10	£25
Oxen, Trex ...	£7	£8	Mules ...	£20	£22 10
Cape Sheep, good ...	14 0	17 0	Donkeys, Geldings ...	£4 10	£7
			Donkeys, Mares ...	£5	£7 1
			Pigs, (clean), per lb ...	3d	3 3/4d

Johannesburg Produce Commission Agency, Nox. 11th, 1910:

Bran, per 100 lbs ...	6 6	7 3	Oats, feeding ...	9 0	10 0
Barley, per 150 lbs ...	12 6	14 6	Onions, yellow (Colonial) ...	11 6	13 6
Beans, 203 lbs (Mixed) ...	15 0	18 0	Best Natal, Cape and O.R.C. ...	13 6	15 6
Beans (Sugar) per 203 lbs ...	17 6	27 6	Potatoes, Best Transvaal ...	13 6	15 6
Chaff, per 100 lbs ...	2 6	3 6	" " new ...	12 6	15 6
Forage (Oathay) Best ...	6 0	6 3	" medium ...	10 0	11 6
" " medium ...	5 3	5 9	" inferior & small ...	8 6	9 6
" " inferior ...	4 0	5 0	" sweet ...	6 0	8 6
Kaffir Corn, white ...	11 6	12 0	Peas (Dry) per 203 lbs ...	15 6	16 6
Kaffir Corn, mixed ...	12 0	12 5	Tobacco, cut, per lb. ...	3d	5 1/2d
Lucerne, per 100 lbs., Dry Sound ...	6 0	6 9	" leaf, per lb. ...	4d	7d
Mealies, white ...	7 0	7 6	" roll, per lb. ...	3d	7 1/2d
Mealies, yellow ...	8 4	8 7	Wheat ...	18 6	20 0
Rye ...	12 3	12 9	Sifted Boer Meal, per 200 lbs ...	23 6	27 6
Oats, Seed (clean) per 153 lbs ...	10 6	11 6			
Fowls, Best Large Hens and Cocks ...	3 0	3 6	Geese ...	5 6	6 6
Fowls, Medium ...	2 7	2 10	Pigeons ...	7d	9d
" Mixed and Small ...	2 3	2 6	Eggs, Fresh, per dozen ...	10 1/2d	11 1/2
Ducks ...	3 0	3 6	Eggs, Country ...	9d	10 1/2d
Turkeys, Cocks, Large ...	10 6	17 0	Butter, Eating, per lb ...	1 5	1 7 1/2
" Hens ...	6 6	8 0	" Cooking " ...	1 3	1 4 1/2

LIVESTOCK.

Donkeys ...	£6 15	£7 15	Oxen ...	£13	£15
Mules, small ...	£15	£15 10	Slaughter Cows ...	£7 10	£9
" Large ...	£18	£26	Afrikaner Hamels ...	17 6	22 6
Horses ...	£12	£25			

Wightman & Co., Ltd., Salisbury, 21st Nov., 1910:—

Mealies, per 203 lbs ...	7 6	10 0	Manna Hay, per 100 lbs ...	—	—
Rapoko, per 203 lbs ...	9 6	11 0	Beans, per 200 lbs ...	27 6	30 0
Oat Forage, per 100 lbs ...	8 6	9 0	Monkey Nuts, shelled, p. lb ...	—	—
Onions, per lb ...	3d	3 1/2d	do. unshelled, per 83 lbs ...	8 0	9 0
Potatoes, per lb ...	1 1/2d	2d	Wheat, per 200 lbs ...	29 0	30 0
Munga, per 203 lbs ...	9 0	11 0	Oats, per 153 lbs ...	22 6	25 0
Salt, per 200 lbs ...	17 6	20 0			

Whitfield & Co., Salisbury, 26th Nov., 1910.—

Cows, good milkers ...	£25	£35	Mules, inoculated ...	£30	£35
Cows, Native ...	£9	£10	Mules, not inoculated ...	£25	£30
Heifers, Colonial ...	£7	£8	Horses ...	£25	£30
Heifers, Native ...	£6		Donkeys, Colonial ...	£8	£9
Trained Oxen, large ...	£12	£12 10	Donkeys, G.E. African ...	£7	£8
Trained Oxen, ordinary ...	£10	10	Sheep, Colonial ...		24/-

Departmental Notices.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficiently general interest.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were

sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, to the Agriculturist.

TOBACCO SEED.

All enquiries for tobacco seed should be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of

Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

BOTANICAL SPECIMENS FOR IDENTIFICATION.

In all cases where a botanical identification is required it is of the utmost importance that the specimens reach this office in a thoroughly dry condition, free from mildew, and intact, that is not broken in pieces. Whenever possible specimens should comprise main stem or small branch, leaves flowers, seed vessels and roots and bulbs, though these need not necessarily be on the same plant.

The colour of the flowers and the general form of the plant should be preserved by pressing and drying between two sheets of blotting paper or newspaper. Ordinary plants not excessively succulent can be dried sufficiently in three days, provided the drying papers are changed every day. A moderately light weight should be placed on the driers in order to press the specimens flat.

Correspondents are asked to supply the following particulars as far as possible.

- (a) Height and general appearance of plant or tree.
- (b) Class of soil on which found.
- (c) Locality and altitude.
- (d) Supposed use or properties.

It is advised that specimens be packed between two sheets of cardboard or thin wood, since in this way they will travel long distances without fear of injury.

DESTRUCTION OF WILD CARNIVORA, ETC.

The undermentioned rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£3 0 0
„ Leopard	£1 0 0
„ Cheetah	£1 0 0
„ Wild Dog	£0 10 0
„ Crocodile, of not less than 3ft. in length	£0 10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may purchase pure bred stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges in selecting the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year, a deposit being made, in the first instance one third of the purchase price on delivery, one third after six months, and the balance a year after purchase. The Government meets risks on rail and until delivery is effected.

Recent purchases include 25 bulls and 75 heifers, comprising Shorthorn, Friesland, Devon, Jersey and Afrikander breeds; 180 Persian sheep, and a small number of pigs. Applications for high-class stud stock only will be entertained.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.

3. The applicant will be required to furnish personal security to the satisfaction of the Board, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart ; standards not further than 45 feet apart ; droppers or lacing not further than four yards apart ; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an officer deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture

from whom further particulars, together with plans and specifications, can be obtained.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice. All applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

CO-OPERATIVE EXPERIMENTS.

In continuation of the system of co-operative experiments, the under mentioned seed will be available from September onwards, for free distribution in small quantities to any *bona-fide* farmer resident in Southern Rhodesia. Seed is supplied f.o.r. Salisbury—experimenters undertaking to forward a faithful report on the result of the experiments at the close of the season, on forms supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to each applicant.

All applications to be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

Maize.—Ladysmith white.

Leguminous Crops.—Lucerne, Egyptian clover, Crimson clover, Velvet beans, Cowpeas, Vetches, and Lupines.

Summer Cereals.—Victoria wheat, Bobs' rust-proof wheat, Sidonian oats, Rye, Egyptian rice, Boer manna, and Japanese millet.

Winter Pasture Plants and Grasses.—Sheeps burnet, Sanfoin, Cocksfoot, Tall fescue, Cowgrass clover, Paspalum, and Phalaris bulbosa slips.

Miscellaneous Seeds. — Virginia peanuts, Castor oil, Linseed, Cotton and Broom Corn.

FORESTRY: SALE OF SEEDLING TREES.

It is anticipated that the undermentioned seedling trees will be available for sale from December onwards. The trees are grown on the Experiment Station, Salisbury, and will be sold at a price of 1d. each or 8/4 per 100 f.o.r. Salisbury. With the exception of one or two hardy kinds, the trees will be grown in tins and will be placed on rail in this condition. If required to be sent by Agricultural Parcels Post, they will necessarily have to be removed from the tins, but this method of forwarding is not recommended.

Orders must be accompanied by cheque or Post Office Order for the necessary amount, and the Department is unable to reserve trees unless payment has been received. Orders should be received at least seven days before the date on which despatch is desired, and after delivery of trees to the Railway Company, the Department can accept no further liability.

As stocks are limited application should be made early, and should be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

<i>Acacia melanoxylon</i>	Blackwood
* <i>Cedrela toona</i>	Indian or Singapore Cedar
<i>Cupressus lusitanica</i>	Goa cypress
<i>Cupressus guadaloupensis</i>	Guadaloupe cypress
<i>Cupressus semper-virens</i>	Common cypress
* <i>Dalbergia sissoo</i>	Indian sissoo
<i>Eucalyptus bicolor</i>	Bicolor gum
<i>Eucalyptus citriodora</i>	Lemon scented gum
<i>Eucalyptus ficifolia</i>	Red-flowering gum
<i>Eucalyptus longifolia</i>	Woolly-butt gum
<i>Eucalyptus polyanthema</i>	Red box tree
<i>Eucalyptus rostrata</i>	Rostrata gum (Red gum)
<i>Eucalyptus saligna</i>	Saligna gum
<i>Eucalyptus tereticornis</i>	Tereticornis gum
<i>Eucalyptus viminalis</i>	Manna-gum
<i>Grevillea robusta</i>	Silky Oak
<i>Jacaranda minosifolia</i>	Jacaranda
<i>Juniperus Bermudiana</i>	Bermuda pencil cedar
<i>Juniperus monosperma</i>	
<i>Juniperus procera</i>	East African Cedar
<i>Pinus canariensis</i>	Canary pine
<i>Pinus halepensis</i>	Aleppo pine
<i>Pinus insignis</i>	Monterey pine
<i>Robinia pseudacacia</i>	Locust acacia

Hedge Plants.

<i>Abergia caffra</i>	Kei apple
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*—These trees are sufficiently hardy to be transplanted direct from seed beds, and are not therefore sold in tins.

SALE OF PASPALUM PLANTS.

Roots of this valuable winter pasture grass, suitable both for moist and dry situations, will be available for sale from December onwards at the rate of 5/- per 1,000 slips, f.o.r. Salisbury. A root can be broken up into from thirty to fifty or more slips, and when ordering, the number of slips required should be stated. Applications accompanied by remittance to be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country,
by R. Mellwaine, M.A., LL.B.

Winter Feeding of Farm Stock, by H. Godfrey Mundy.

Ensilage, by H. Godfrey Mundy.

The Conservation of Kraal Manure, by H. Godfrey Mundy

The Preservation of Butter.

Rhodesian Standard Types of Maize and their points, by H.
Godfrey Mundy.

Requirements in sending Botanical Specimens to the Department for identification.

The Use of Lime in Agriculture, by G. N. Blackshaw. B.Sc.

CROPS.

How Maize can be made more profitable, by H. Godfrey Mundy.

Cotton Cultivation, by J. L. Stinson.

The Ground-nut or Pea-nut, by H. Godfrey Mundy.

Maize Growing, by H. Godfrey Mundy.

Onion Growing, by H. Godfrey Mundy.

Tobacco, by G. M. Odium.

Flax, *Linum usitatissimum*, by C. E. F. Allen.

Possible Rotation of Crops for Southern Rhodesia, by H.
Godfrey Mundy.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

Onion Thrips, by R. W. Jack, F.E.S.

“Foul Brood” in Bees, by Rupert W. Jack, F.E.S.

Importation of Plants, etc., Regulations, by Rupert W. Jack,
F.E.S.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

The Tsetse Fly, by Lt. E. W. Bevan, M.R.C.V.S.

Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.

The Relationship of Ticks and Disease, by Rupert W. Jack, F.E.S.

The Head Smut of Maize, (*Sorosporium reilianum*), by H. Godfrey Mundy.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.

Black Orange Aphis, by Rupert W. Jack, F.E.S.

Citrus Pyslla, by Rupert W. Jack, F.E.S.

Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.

Regulations affecting the Importation of Potatoes, by Rupert W. Jack, F.E.S.

VETERINARY.

Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.

Interim Report on the Animal Trypanosomiasis of Southern Rhodesia, by L. E. W. Bevan, M.R.C.V.S.

Wireworm or Hairworm in Melssetter District, by E. M. Jarvis, M.R.C.V.S.

Accidents to Calves after Calving, by J. M. Sinclair, M.R.C.V.S.

Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. F. MacGregor.

African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition).

Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.

Strangles, by F. D. Ferguson, M.R.C.V.S.

Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.

How to make use of the Fencing Ordinance, 1904, by N. H. Chataway.

Government Aid in Fencing.

Special Rates for the Benefit of the Farming Community in Southern Rhodesia.

The Time and How to Find it, by Rev. Father Goetz, S.J.

Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.

Plans and Specifications for Cattle Dipping Tanks.

Prizes and Rules for Competition for Collections of Plants of Economic Importance.

Plans and Specifications for Tobacco-Curing Barns.



Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue:—

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The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Government Notices.

No. 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to

immediate destruction.

3. The areas set out in Schedule "A" and such further areas as may be added to the said schedule shall be used in connection with pastures lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, anthrax, emphysematitis or African Coast Fever.

The importation of the above set out to be of full force and effect for the depasturing and quarantining of animals for slaughter in connection

with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of

Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Saverombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about $2\frac{1}{2}$ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district ofin the
.....Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station

will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....
Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....
 Date
 Application
 Permit No.

ANNEXURE "B."

I.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls..... Heifers.....
 Breed.....

Seller's Name and Address.....

Purchaser's Name
 Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be
 true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals
 Diseases Consolidation Ordinance, 1904," I do hereby cancel and
 repeal Government Notice No. 124 of 1908, and do hereby declare and
 make known that, notwithstanding anything to the contrary elsewhere
 provided, the importation of cattle for bona fide slaughter purposes may
 be permitted into the Umtali district from the adjoining Portuguese ter-
 ritory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of
 these regulations, shall be under the absolute control and direc-

- tion of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be de-trucked at the slaughter enclosure and immediately confined therein.
 - (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
 - (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
 - (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
 - (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
 - (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the afore-said Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.
2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.
3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not

exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two

miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 391 of 1908]

[17th December, 1908]

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1903," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any

second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the pro-

visions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. **O**N and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lung-sickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls "	0	5	0
d. " donkeys "	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable

time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 281 of 1909]

[2nd December, 1909

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:—

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophyctis endobitica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODERIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which, is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by
 - [1] A certificate by a Government Veterinary Surgeon of the territory of origin that
 - a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
 - [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.

Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....

Government Veterinary Surgeon
(or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

3. CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....

Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 168 of 1910.]

[30th June, 1910.

MOVEMENT OF CATTLE: MAZOE, GOROMONZI,
MARANDELLAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the regulations promulgated by Government Notice No. 68 of 1910, and so much of Government Notice No. 216 of 1909 as may be repugnant to or inconsistent with the subjoined regulations, and make the following provisions in lieu thereof:—

1. The movement of all cattle is hereby prohibited within the following areas:—

[1] The native district of Mazoe south of a line drawn from the northernmost beacon of Moore's grant to the north-east beacon, and thence to the south-east beacon of that estate; thence to the eastern beacon of the Howick Estate; thence to the eastern beacon and to the southern beacon of Burley Bottom, and thence to the south-western beacon of Belford Estate No. 2; thence following the western and southern boundary of Belford Estate to the westernmost beacon of Springvale; thence following the southern boundary of Springvale and Great B, and the eastern boundary of the latter farm to the southernmost beacon of Arnold's; thence in a line eastwards to the western beacon of Pote, and thence along the northern boundary of that farm to the Poorti River.

[2] The native district of Goromonzi south of a line drawn from the north-west beacon of Bonny along the western boundaries of that farm and the Vale to the south-west beacon of the latter and from that point along the northern boundary of the Msana Reserve to the Inyagui River.

[3] The commonage of Salisbury.

[4] The following area partly within each of the native districts of Goromonzi and Marandellas from the south-west beacon of Roraima along the western boundary of this farm to the south-west beacon of Essexdale, thence to its north-west beacon, thence to the north-east beacon of that farm, thence along the north-west boundary of the farm Shortlands, thence along the western boundary of Loquat Grove to its north-west beacon, thence up the Inyagui River to the north beacon of Cotter, thence to its eastern beacon, thence to the north-west beacon of March, thence along the north-eastern boundaries of the farms March, Bovey Tracey, and Mangwendi Mission, thence from the north-eastern beacon of the last-named along the north-eastern boundary of the farms Gatzi and Allen, thence along the eastern boundaries of Ta ra ra, Boom, De ay, thence along the southern boundaries of De ay, Alexandra, Waltondale, Dudley Estate, and thence along the western boundary of Dudley Estate to its north-western beacon, thence along the southern and western boundaries of the Lendy Estate to its north-western beacon and thence to the southern boundary of Roraima to the first-named point,

save and except—

- a. on permission granted by an Inspector or Sub-Inspector or other officer authorised by the Administrator;
- b. with the boundaries of any single farm where such cattle are depastured;
- c. for cattle, the property of natives, within a radius of four miles of their owner's kraal, situated within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof.

2. The following movements of cattle may be permitted within the above-mentioned areas under the written authority of an official thereto duly authorised and subject to such conditions as it may be deemed expedient to prescribe—

- a. slaughter cattle to centres of consumption;
- b. cattle for mining and farming purposes, including oxen required for ploughing, cattle required for breeding or dairying and grazing, but the latter only where shortage of pasturage or water is proved to exist;
- c. cattle detained *en route* under Government Notice No. 68 of 1910;
- d. transport cattle solely for the purpose of wood riding to one mine or group of mines and within such limits as may be endorsed on the permit, and for the purposes of the sanitary service only within the commonage of Salisbury, exclusive of that portion defined in section 3 b.

3. No cattle shall be permitted to enter or leave the under-mentioned areas:—

- a. the farms Glerwyn, Stamford, and Plot 50, Avondale, in the native district of Goromonzi;
- b. that portion of the commonage of Salisbury bounded by the railway from the point where it enters the commonage on the west side of the Hillside crossing, thence along the fence on the banks of the Makabusi River and up that river to its junction with the eastern boundary of the commonage and thence following the boundary in a westerly direction to the point first named;
- c. the farms Bitton and Syston, both situated in the native districts of Maroe and Goromonzi;
- d. the fenced area of Marandellas, including the farms Rockery, Progress, Longlands, Revolt, Rakodzi, Springvale, Retreat, Uplands, Glensomers, Elmwood, Rusawi Outspan, and a portion of Lottie.

4. The removal of the following articles from the areas mentioned in 3 is prohibited, save and except with the permission, in writing, of the Chief Veterinary Surgeon:—

Green forage, hay of any sort, fodder, bedding, reeds, manure, or any other article which may reasonably be supposed to convey infection.

5. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect to each offence, to the fines and punishments prescribed by the Ordinance; and in cases where no special punishment is provided, to a fine not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 165 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazeley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Beira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory en route to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
Government Veterinary Surgeon.

(16) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 281 of 1910.]

[13th October, 1919.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles:—Green forage, hay of any sort, fodder, bedding, reeds, manure or any article which may reasonably be supposed to convey infection, from the undermentioned areas, save and except with the permission in writing of the Chief Veterinary Surgeon.

1. Crocodile Valley Farm
 2. Essexvale
 3. Essexvale Extension
 4. The native district of Inyanga
 5. That portion of the native district of Makoni lying north-east of the railway.
- Umzingwani District.

No. 229 of 1910]

[17th August, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

[18th August, 1910.

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzanyama and Bulalima-Mangwe, save and except westwards of the south-

eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
 The Oleander Scale (*C. hederæ*)
 The Circular Purple Scale (*C. aonidium*)
 Ross's Black Scale (*C. rossi*)
 The Purple or Mussel Scale (*Lepidosaphes beckii*)
 The Long Scale (*L. gloveri*)
 The White Peach Scale (*Aulaca pis pentagona*)
 Woolly Aphis or American Blight (*Schizoneura lanigera*).

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
 Postmaster General.

General Post Office, Salisbury,
 20th July, 1909.

ADVERTISEMENTS.

RUBBER TREES

Ceará: 1s. to 1s. 6d.; seeds 10s. per 1000, 7s. per lb., postage extra. Cash with order.

C. F. M. SWYNNERTON, Melsetter.

MESSRS. MACLAURIN BROS.

(Breeders of Pedigree Friesland Cattle.)

Orders are being booked for young pure-bred Friesland Bulls bred by pedigree sire and dam.

These Bulls are bred and reared on the Farm Pomona, near Salisbury, a Redwater area, and thus farmers may obtain highly bred animals without the usual risks attending importation and immunising.

Particulars of pedigree and prices will be obtained on application to Messrs. MacLaurin Bros., Salisbury.

FLORIDA ONION SEED.

Special variety acclimatised in Rhodesia, long-keeping, never necky, prolific. Obtainable in limited quantities. Price, 1s. 6d. per oz.; 20s. per lb., post free.

RUBBER SEED.

Supplied in large quantities, 4s. per lb., post free.

A. BRUCE GRAY,

Mlianama Farm.

Postal address: Feira, N.W.R.

FOR SALE.

Shorthorn Bulls, Africander Bulls, Half-bred Shorthorn Bulls; all classes of stock for farm or trek. As no milking is carried on the young stock is particularly well grown, being hardy, well bred and acclimatised. The Rhodesia Ranching Coy., Darwendale Estate, Umvukwe.

ADVERTISEMENTS.

FOR SALE.

Pedigree Bull Terrier Puppies, by "Kimberley Rocket," dam "Westburne Duchess"; prize winners. Also a brace of pedigree Airdale Puppies by Champion "Forward Clonmel" dam Champion "Forward Blackberry," winners of many first prizes. These dogs are ideal for the farm, faithful and courageous.

For particulars, apply to G. J. AUSTIN, Benwell,
P.O. Kimberley Reefs.

FOR SALE

Half-bred Bull Calves, by Hereford bulls ex-Colonial cows of Afrikander type; bred in the Bulawayo district on Red-water veld.—Apply: C. S. Jobling, Devonby, Bulawayo.

SITUATION.

Colonial, aged 29, married, with 15 years experience in Horti, Viti, and Fruit Culture, also Forestry, Stock and General Farming, desires position as manager on farm. Well educated, Kaffir and Dutch linguist. Best references, etc.

64/48 c/o Director of Agriculture.

RED LINCOLN HERD.—The "Haakon" Herd.

Famous for hardiness, general utility and satisfactory results at the principal shows. All animals entered in Herd Book, true to type and colour and carefully bred. Sires used:—Weston Bob, 4185, by Royal Crest (C.H.B. 82149), ex dam by Covenham Tom 1501; Pendley Corrector 6249, by Keddlington Comet, 3443, ex Keddlington Peacock III, vol. 13, p. 240. Cows:—Nonpareil by Scrampton Expansion 4093, ex Nonpareil 6, 1st Royal Show. Northboro Bess by Melton Duke C.H.B. 75058, ex Dowsby Russet, vol. 7, p. 151. Haakon Dairymaid by Smethwick Prince 1678; Haakon Daisy by Sunbeam 1370. Yearling Bulls from £35 each. Heifers from 25 guineas. Also Pure Lincoln Rams from 12 guineas, and Ewes from 5 guineas. T. W. ATKINSON, Manor House, Greatford, Lincolnshire, England.



THE RHODESIA AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

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Editorial.

DAIRY INSTRUCTION.—We publish *in extenso* a record of her tour through Rhodesia, furnished by Miss E. A. Maidment, who recently gave a series of lectures and demonstrations throughout the Territory.

There are not wanting at the present time indications of a desire on the part of many farmers for instruction and guidance in the treatment of milk, and Miss Maidment's visit may be credited with calling attention prominently to the possibilities in this direction, not only for improvement of present methods but for the systematic development of the dairy industry along modern lines. Interest has been awakened. Difficulties, which to the tyro seem sufficient to render hopeless all idea of butter-making or cheese-making, can be overcome by the methods of scientific dairying which have been applied with such conspicuous success in countries so apart and dissimilar as Australia, Denmark, Argentina and Siberia. While we have peculiar difficulties, it is satisfactory to learn that Miss Maidment finds we have also special advantages, and that to quote her own words; "I proved beyond a doubt from practical experience that Rhodesia can produce the finest cheese and butter in the world. In spite of great

disadvantages always encountered when an audience has to be considered, I made some of the finest butter and cheese that I have ever seen." This is praise, indeed.

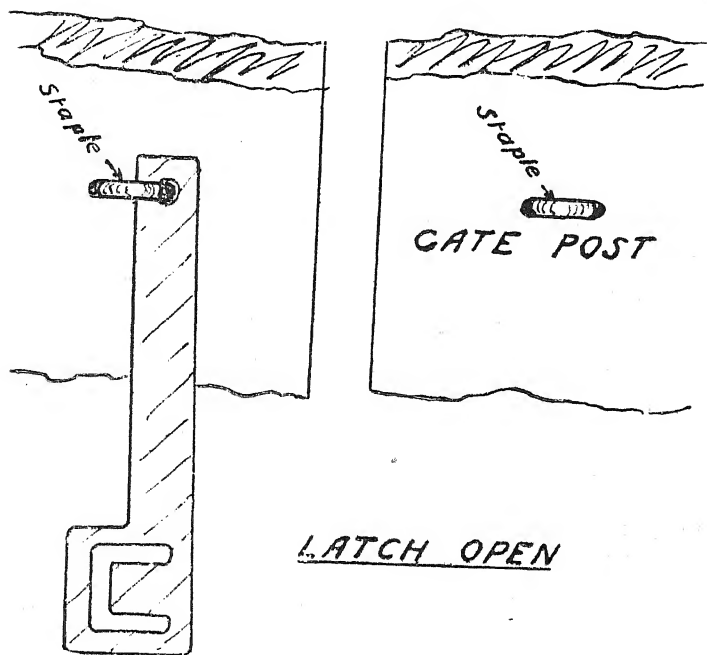
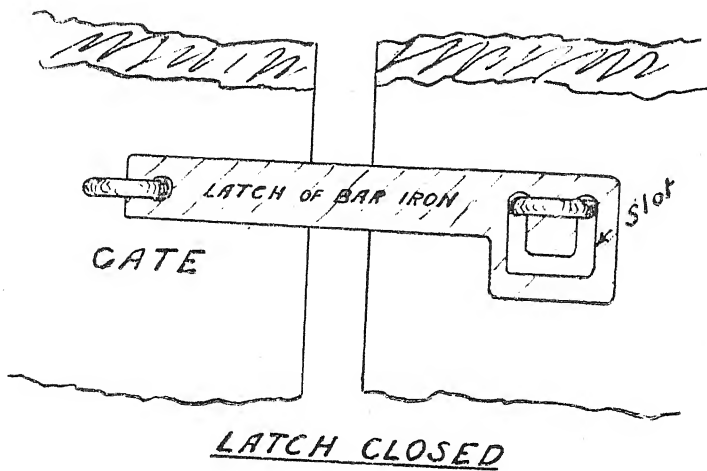
THE TRANSMISSION OF DISEASE.—The Rhodesia Scientific Association requests us to call attention to the following offer contained in a resolution passed at a recent meeting to the effect:—

That a Gold Medal be offered for an original paper advancing our knowledge of the transmission of any insect or arachnid borne disease affecting Rhodesia. Such paper to be read at a meeting of the Rhodesia Scientific Association for publication in its Proceedings. The medal will only be awarded for a paper which in the opinion of the Council is of sufficient scientific merit.

Non-residents as well as residents in Rhodesia are invited to send in papers which should reach the Secretary, M. D. Niven, Rhodesia Scientific Association, P.O. Box 586, Bulawayo, not later than the 31st July, 1911.

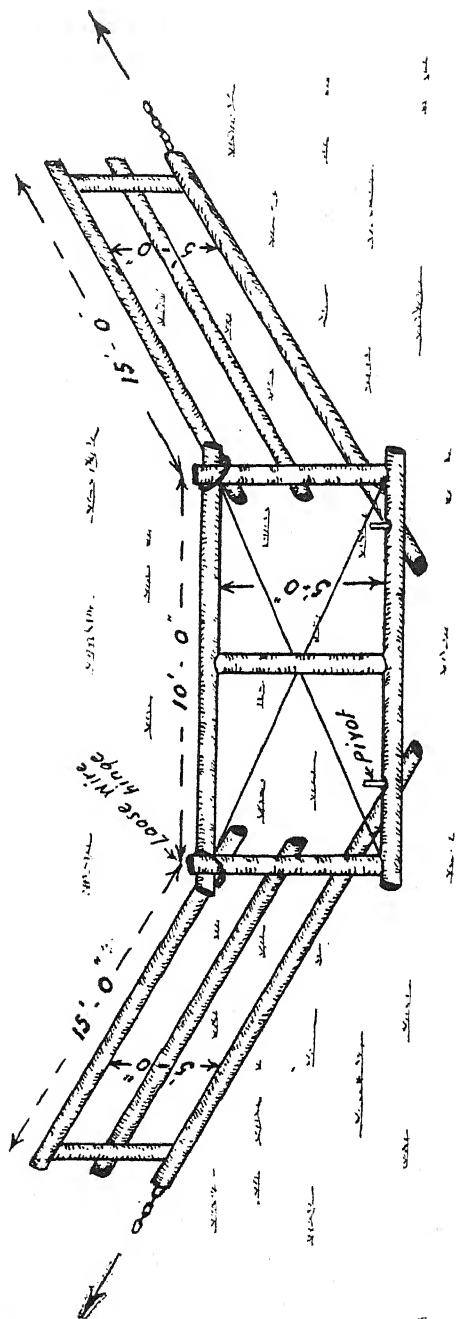
LECTURES FOR FARMERS.—Attention is called to particulars given under the heading of *Departmental Notices*, of arrangements which have been made furnishing addresses on agricultural and veterinary subjects to meetings of Farmers' Associations, or otherwise. The object aimed at is to convey information in an attractive form, and in a direct and practical manner and also to provide opportunities for discussion and for the interchange of opinions on farming matters instructive and helpful alike to farmers and to the specialists of the Department. Suggestions regarding subjects not mentioned in the list will be welcomed, as it is desired in every way to meet the needs of the farming community. It is hoped that this effort may meet with a favourable reception.

LINCOLN RED SHORTHORN CATTLE.—We would call attention to the article by Mr. G. E. Collins, of Caistor, England, on the Lincoln Red breed of cattle. The paper and the illustrations we give were kindly obtained by Mr. Evans, the prominent breeder and apostle of the breed, who recently visited Rhodesia. Mr. Collins is the author of the "History of the Lincolnshire Red Shorthorn"; "Lincolnshire Agriculture"; etc., and is entitled to write upon this theme. In our next issue we hope to be able to publish the views of a prominent breeder of Lincoln Reds in Rhodesia, and to give pictures of locally-bred specimens.



Gate Fastener ($\frac{1}{3}$ actual size.)
 W M W del.]

Sketch of Hay Conveyor and Collector



STAFF.—The additional veterinary surgeons recently appointed have now arrived and are in process of entering upon their duties and being initiated into the peculiarities of the country. Their arrival is opportune in view of the anxious time we are experiencing on account of the reappearance of African Coast Fever. The following are the gentlemen appointed, all fully qualified veterinary surgeons, Messrs. Chatterley, Pinchin, Myhill, Williams and Kingcome. Mr. Jarvis has also returned from leave of absence so that the veterinary staff is materially strengthened. Mr. Offord has resigned and steps are being taken to fill this vacancy.

Mr. R. H. B. Dickson has lately joined the Department of Agriculture as an additional agricultural specialist and adviser in connection with crops and arable farming. Mr. Dickson has previous experience of South African conditions and, after completing his technical training in England, studied in the United States and in the West Indies, giving particular attention to cotton and maize and tropical crops, knowledge which will prove useful in his present sphere of labour as he will be largely occupied in conducting experiments and in advising farmers on these and kindred matters.

A HANDY GATE FASTENER.—The accompanying illustration shows an ingenious and simple device for fastening a gate in such a way that stock cannot force it open, but that it can be readily opened or fastened by hand. The mechanism consists of two staples and a flat strip of iron about eight inches long, one inch broad, and $\frac{1}{8}$ in. thick in the end of which a slot as shown is cut. The latch is attached to the gate by the one staple, and when the gate is closed the slot fits over the second staple in the gate post, and drops into place and is kept closed by the tongue. Should it be desired, the gate can be securely locked by putting an ordinary padlock on to the staple on the gate post. To act properly, the gate or door must be well hung and remain in proper relationship to the gate post. This latch is in use on M'gutu, a farm belonging to Mr. Pretorius, in Mazoe district.

RUBBER.—The following report by Messrs. W. J. and H. Thompson, of 38, Mincing Lane, London, E.C., is forwarded by Mr. C. F. M. Swynnerton, of Gungunyana, Melsetter, and

refers to samples tapped from three year old trees on that farm. The results cannot be regarded as other than highly gratifying.

No. 1a.—Fine Ceara Scrap, clean, pale and fairly strong.

No. 1b.—Fine Ceara Scrap, clean, pale and fairly strong.

No. 2.—Fair Ceara Scrap, a little mixed in colour, clean but rather weak and sticky to the touch.

No. 3.—Fine Ceara Scrap, clean, pale and strong.

The values of Nos. 1b. and 3, if shipped in quantity, say a few cwt.s., would be about $5\frac{1}{2}$, $5\frac{5}{6}$ per lb. on to-day's market, with Brazilian standard rubber; hard-cure fine at $5\frac{1}{2}$ per lb. and the merit of these samples, as indeed of all the six, is their cleanliness and freedom from impurities. The value of Nos. 1a. and 2 would be a few pence lower than 1b. and 3, say about $4\frac{1}{6}$, $4\frac{1}{10}$ per lb.—provided always in quantity and well up to the small sample before us. Of the four lots of Scrap we prefer the No. 3, which seems stronger and of lighter colour than No. 1b.

No. 4.—Small irregular Ceara biscuits, good, clean and strong, value to-day in quantity about $5\frac{1}{6}$, $5\frac{1}{7}$ per lb.

No. 5.—The yellow portion of this sample as No. 4, but the black piece ("boiled") is poor, weak and lacking in resiliency.

No. 6.—As No. 4, perhaps the best sample of the lot, value in quantity about $5\frac{1}{7}$ per lb.

A HOME-MADE HAY COLLECTOR.—To save time and labour in the busy hay season is to save and make money. Hay collectors are costly as a rule, but the pattern shown in the accompanying illustration made out of rough native wood with the help of a few bolts and a little wire, is cheap and effective. It runs as a sled over the grass stubble, the central portion or back resting on pivots on the arms which swing in or out to any desired width. This arrangement is in use on Mr. Newmarch's farm, Thornpark, near Salisbury.

The swathes as left by the mower are gathered into windrows by the horse rake. This collection is then drawn along by animals attached at the point of draft indicated by the arrows and gathers the hay in front of it and conveys it to the side of the stack onto which it may be lifted by hand, or

by mechanical forks or spears and a derrick. Large quantities are thus expeditiously handled, and the labour of loading and off-loading a wagon for conveyance for a short distance is dispensed with.

THE MIGRATION OF LOCUST BIRDS.—Some time ago in these pages we called attention to efforts being made to study the migration of birds in Europe, and to the fact that marked specimens have been found occasionally in different parts of South Africa. Mr. J. Ward, of Lemon Kop, Melsetter, has recently reported that on the 28th of December, his dogs killed a white stork (*Ciconia alba*), well-known as one of the most useful as well as the largest of the locust birds. On one of its legs was found an aluminium ring bearing the inscription, "*Ornith, Budapest, Hungaria, Központ, 2537.*" Similar instances have been recorded on eight occasions during the past two years from the Orange River Colony, the Cape (Eastern Province), Natal, Basutoland, and Transvaal; but this is the first known case in Rhodesia. The details have been furnished to the Central Locust Bureau, Pretoria, and to the Royal Hungarian Central Bureau for Ornithology.

The information is not only of interest as proving the identity of our storks with those of Europe, but of scientific importance in the study of the problems of the migrations of birds, round which so much mystery still clings. It is requested that any similar observations may be reported. The stork it should be remembered is one of the birds specially protected by law.

APICULTURE.—We would bring to the notice of Rhodesian bee-keepers the existence of an association in South Africa, charged specially with their interests. The objects of the South African Bee-keepers Association are as follows:—

- (1) To disseminate knowledge of bee keeping under the varied South African conditions amongst its members.
- (2) To influence legislation favourable to the industry.
- (3) To popularise and extend the keeping of bees.
- (4) To secure the lowest possible rates and best possible treatment for honey, hives and appliances over South African Railways.
- (5) To open up markets for the sale of members' honey in every South African centre of population.

In this country, where bee-keeping as an industry has hardly as yet been started, there is great room for useful work along these lines, and for the co-operation of those interested in the subject. The subscription of 12/6 per annum entitles members to receive the *S.A. Agriculturalist & Stock Breeder*, which periodical is the official organ of the Society. The Hon. Secretary is Mr. H. F. Bengler, P. O. Box 772, Johannesburg.

Owing to restrictions imposed in order to exclude the disease known as "foul brood" which has not yet gained a footing in South Africa, bee-keepers have had difficulty in obtaining foundation comb. This should now be overcome as foundation is now being manufactured from South African bees wax in the Transvaal, and is obtainable from F. and F. Fertilisers Co., Kempsey Buildings, Johannesburg, or from the maker, Mr. W. Paatz, Saxonia Wax Foundation Works, P.O. Box 1772, Johannesburg.

THE 25TH FARMERS' ASSOCIATION.—Farmers' Associations continue to spring up on all sides, the latest formed being that of North Melsetter, which will meet quarterly at the Mutambaras Mission Station, Umvumvumu, under the presidency of Mr. R. A. Hurley. The Secretary is Mr. Norman N. Rutherford, Tom's Hope, P.O., Steynstroom.

In this connection we would call attention to the list of Associations, Secretaries and dates of meeting so far as these have been received, which is published in this number.

VETERINARY INSTRUMENTS.—We have received a Catalogue of Veterinary Instruments and Appliances from Messrs. C. E. Gardner & Co., Ltd., Port Elizabeth.

In addition to a large selection of veterinary instruments the book contains a list of appliances which every farmer should have, amongst which may be mentioned, ear punches, nose punches, bull holders and rings, drenching horns, trocars, canulae.

The eight-guinea veterinary outfit contains all the instruments required for ordinary work on a farm and is worthy of the attention of cattle owners.

The catalogue also contains a list of remedies for most of the diseases of horses, cattle, sheep and dogs, but it is to be doubted if these have any advantage over the administration of medicine which the commonsense and experience of the cattle owner indicate.

Extracts from a Report on Forestry in Southern Rhodesia.

By JAMES SIM, F.H.A.S.,
Department of Forestry, Union of South Africa.

(Continued).

DISTRUBUTION OF FORESTS BY TYPES.

Although individual species have been referred to in describing the forests, it must be remembered that no hard and fast lines of distribution can be laid down, as the types overlap and merge into each other in a marked degree. As my tours of inspection have only allowed me to observe and inspect restricted areas, I have had to depend to a great extent upon reports received, and such other local information as was obtainable. I therefore only attempt a rough description of the distribution of each type, as I find it impossible with the data before me, to give even approximately, the areas of each.

(1) M'Sasa forest covers a large area of the country both in Mashonaland and Matabeland. Personally I inspected these forests on mixed granite and formation at Odzi, Umtali, and Rusapi; the best forests being on Odzi Reserve which is, however, being quickly cut out, and near Rusapi where it occurs in belts on the granite, and then on formation from Que Que to Hartley by way of the Bembesaan, Sebakwe, Umnyati, Ngesi, Umsweswe and Mombi Rivers and the Mashaba Hills. Much of this is forest of fair quality, but none very good, the best being near Que Que on the hills and East of Gatooma. It is much cut out in places to supply the mines, especially in the area between the Mombi and Umfuli Rivers.

From Que Que westward to the Jombi River, the forest is practically cut out, but between the Jombi and the Mafungabusi Mountains is the best area of M'Sasa forest which came under my observation in the country, especially in the vicinity of the Ingondoma and Scombela Vleis on deep, light sandstone soil.

Near Salisbury on the formation, belts occur of little value but on the Menninne and Maquadzi Rivers, near Banket Junction close but low forest occurs on mixed soils and in the Hunyani Mountains good forest occurs, while west of these, where sandstone and formation alternate, belts of good trees are found on the sand ridges. In Mazoe Valley, near Iron mask, forests occur at the base and up the slopes of the kopje, while the deep, good soil carries scrub. I am told it often occurs in quantity north of this, also in the Mangwendi Districts, as well as southward into the north end of Victoria and Melssetter. It will thus be seen that a large part of the country is practically covered with this type, which also occurs to the north of the Zambesi.

(2) I'Gusi forests are confined to a wide belt of deep sandstone soil in the vicinity of the Gwaai and Shangani Rivers. It is plentiful near the junction of the Khami and Gwaai rivers, and continues on belts almost continuously to near Inyantui, and again appears in the vicinity of the Victoria Falls. It is said to occur northward beyond the Shangani River and east to near the junction of the Gwelo and Vungu Rivers with the Shangani, thus covering a large area of country in belts. some good and some poor, intersected by treeless vleis.

(3) Mopani Forests. No part of the country can be specially mapped out for this type as it occurs in patches on large belts all over. In the greater part of Mashonaland it is hardly known, but in the North, in the Low Country falling to the Zambesi belts are said to be fairly numerous. I came into contact with good belts of Mopani to the north of the Gorkwe Hills in the Sessemi Valley and again at Wankies. To the West and South I understand it is found in belts through Wankies, Bulilima, Gwanda and Tuli. Some of the belts in the Gwanda District which I inspected are of fair quality. I also saw some very good belts mixed with the M'Sasa, near Hartley. Although nowhere continuous, it is thus fairly widespread and is frequently found with its cogenor Knobby Thorn, in the vicinity of the goldfields.

(4) Mashuma. This tree occurs all over the country, except on the poor sands at Ingondoma, in a very scattered fashion on ant heaps and patches of good ground. It was seen at

Odzi, Salisbury, Lomagundi, Wankies, the Victoria Falls, Gwanda, Hartley and Gatooma, but in no place in sufficient quantity to form a good belt.

(5) Mahobohobo. I have only seen small groves of this type on Hunyani Mountains, near Umtali, and near the Sengwe River and on the mountains of the Mazoe Valley, but I understand that it occurs in the warm valleys of the Umkarara and the Honi Rivers on the East, and in many parts of the gold-bearing formation of the North, and is plentiful near Selukwe and in parts of Victoria.

(6) Scrub Forests occur all over the country, but probably the largest area of scrub is to the north and east of Bulawayo. From a little North of where the Gwelo flows into the Shangani to Bulawayo, the forest is of a scrubby type, with parts, like the Somabula Flats, quite destitute of trees. A considerable part of the other types are so poor and irregular that they can only be classed as scrub, and this occurs so persistently throughout the country, that it is not possible or necessary to describe its distribution. This forms the true "bush veld."

(7) Mountain Forests occur all along the escarpment on the Portuguese border in patches, very frequently occupying the site of ancient washouts or gorges in the hills, but at times found in isolated patches in the open. The largest and most important is, I understand, the Chirinda forest (Mount Selinda) which approximately is 600 acres in extent. Other types of mountain forests occur on almost all the inland ranges of hills and were seen by me at Odzi, Rusapi, the Matopos, the Hunyani Hills and Kopjes at Gatooma, and on the Iron Mask in the Mazoe Valley.

DESTRUCTION AND DAMAGE TO FORESTS.

As has already been pointed out, most of the Rhodesian Forests are poorly stocked and many of the trees damaged. There is a constant fight going on between the grass and the forest, and wherever, from any cause, the trees have been removed, grass at once takes its place and savannah is formed with a sparse covering of trees or fairly dense forests on the poorer sands and kopjes. Ant heaps usually carry

good trees, probably from the same reason, and occasionally in river basins and fertile vleis, large individual trees occur.

The Savannah and open character of the forests are, to a great extent, due to natural causes, but there are several destructive and damaging agents which destroy the forests or damage the timber they contain, and which are partly at least, controllable by man. These are: fire, natives, indiscriminate cutting, insect pests.

Fires.—The forests, and indeed the whole country, is swept almost annually by veld fires and if by accident, any part is missed by one year's fire, that of the next year is all the more destructive. Such fires are caused by (1) accident, such as a dropped match; (2), by farmers burning for early grass and not controlling the fire; (3), by burning out vleis to reduce risk of fever; (4), hunting parties and travellers fire it to bring game and make travelling easier and (5), natives, for these reasons, and to reduce risk from wild animals.

In the forest the effect is disastrous, for not only are all the leaves and decaying vegetable material which should go to form the humus, usually making up the forest floor, burnt up and the soil left hard, baked and exposed, but trees of all sizes are consumed or charred. Young seedlings are destroyed, saplings are stunted and the bark burned, sometimes deeply and to a considerable height, leaving wounds with dead tissue ready for white ants or boring insects. In bigger trees such wounds are enlarged and new ones made until at last the trees are killed and fall, to be utterly burned up by the next fire. In many cases smaller wounds heal up, but when the tree is felled and cut up into planks, blemishes in the timber undoubtedly from this cause, are very common, greatly deteriorating the value of the forest. So long as these fires rage unchecked, deterioration is a natural consequence, and there is not the slightest hope of improving the forest.

Natives.—In all forest countries inhabited by uncivilised tribes, destruction of forests is a characteristic feature. No value is placed on trees or timber, except such as contribute to their hand to mouth existence. In making gardens or lands, big areas are usually destroyed by them. Instead of cultivating in the open or using kraal manure, they select

the best bit of forest to be found and begin operations by lopping off the branches from the big trees and cutting the smaller ones off about four feet from the ground. Crowns and branches are spread on the ground and burned, and the ashes spread as manure. Kraal manure, of which many of them have an abundance, is left to accumulate, and is now being used by white farmers in the vicinity. These trees coppice freely and year after year for a time a fresh crop of branches is cut down and burned, until eventually, in about three years, the trees are killed and the natives select a fresh area. In poor places the branches are collected from a considerable area to manure a new patch. The amount of forest destroyed in this manner is very large. One valley between Inyanga and Rusapi on the Liverpool Estate was very noticeable, being practically cleared of good bush leaving dead and charred stumps and ruined soil. Wherever natives are allowed free run of the forest, either on Government land or on private property, the result is the same.

A remark sometimes made to the effect that "the more you cut them, the more they grow" is not at all borne out by facts as observed by me. Where farmers wish land cleared to make open grazing ground, this is a cheap and expeditious way of doing it if the trees have no value. A large number of trees are also destroyed by natives who cut them down in order to get at fruits or insects to eat, and by the removal of bark for beehives, trays, etc. This was seen in a marked degree at Odzi Reserve, where hundreds of trees were cut and left lying, and on enquiry, I found that it was done to get at the pupae of a large caterpillar, which is considered a dainty. Mahobohobo and Mazoe Lemon are often cut down for the fruit and the trees left lying on the ground.

Indiscriminate Felling of Timber.—The legitimate cutting of timber or fuel and the clearing of land suitable for agriculture is necessary and desirable, but the felling of trees as practised in this country is so wasteful and indiscriminate that it can only be classed as destructive. The appearance of areas cut for poles and firewood is lamentable. Stumps three to five feet are seen standing everywhere, while many of the heavier logs and all the light material are left lying on the ground, only such pieces as suit present requirements are taken and

the rest is left to feed grass fires. According to Government Notice of No. 55 of 1905, all trees should be cut at a height of not more than 10 inches from the ground, but this law is very generally ignored. Wood contractors for mines are probably the worst offenders in this respect, but there is little difference; farmers, contractors, miners, and almost everyone cut in a similar manner. The coppice from the high stumps is unthrifty and liable to be broken off and the stumps are very liable to the attacks of white ants.

Insect Pests.—White ants are probably the greatest bugbear of forest growth, and thousands of trees, both indigenous and exotic are annually destroyed. It is said that only dead tissues are destroyed and live tissues are not attacked. It is noticeable that in a forest of good healthy trees the damage done is less, but there is no doubt that live trees are covered with their runs and are destroyed by them. Probably some dead root or twig may give them a beginning and where fire has gone through, ideal conditions are found for the ants in charred and burnt wood and bark. After a forest has been cut, with stumps and logs left lying all over the area, the ants hold high revel and the coppice is frequently destroyed. Borers are also very common and do a great deal of damage, but much less to live trees than to timber, and are therefore not so injurious as ants which attack both.

Several insects also live on the foliage and at times defoliate the trees to such an extent as to be injurious, while others deposit their eggs in the seeds or seed vessels making reproduction and regeneration uncertain. These are usually kept in check by parasites, so that the damage done by them is minimised.

For most of the insect pests all that can be done is to keep the sylvicultural conditions as good as possible so that the trees are healthy and can withstand the attack, but with ants the case is different, and everything should be done to get clear of them. A few remedies have been suggested and arsenical poisoning usually forms the base of these. Probably the most likely method is to make a strong solution of arsenic and in this soak a piece of leather, some straw or other article favoured by the ants. This should be placed overnight in the vicinity of their nests and removed every morning. The cannibalistic tendencies of the ants will make the effect cum-

ulative, and reach the queen's nest. It has also been suggested that the nests should be dug up and the queen destroyed, and there is no doubt that frequent cultivation of the ground helps to make them move their quarters.

INTRODUCTION OF EXOTICS.

Indigenous forests, as has been said, cannot be made to supply all the timber which is required in the country, and as the requirements increase, will be less able to do so, and plantations of exotic trees are therefore necessary to fill up with quicker growing trees, a large part of the timber requirements of the people. In other countries such plantations have been successfully established, partly by private individuals and partly by the State.

At present the data available with regard to the varieties to plant, how to plant them and the most suitable localities are very meagre, but in spite of this, several successful private plantations have been established.

In Cape Colony plantation work was begun about 1880 by Mr. J. S. Lister, I.S.O., now Chief Conservator of Forests of the Union, at Worcester with a small plantation which has in itself proved a very good investment, having much more than paid initial expenses. It has had a still greater value, however, in being the beginning of the extensive planting operations now carried on. In a few years over sixty experimental plantations had been planted all over the country. With about five exceptions these are all still being carried on, while taking advantage of the information acquired regarding soils, locality and suitable varieties, a considerable number have been extended into large and valuable plantations, several of which are now more than self-supporting. In the Orange Free State and the Transvaal a beginning was made in the same way, and the work is extending.

The conditions and flora in Southern Rhodesia are considerably different from that of the Southern States, and experience must be gained in the same way, by establishing as many experimental plantations as can be begun with the funds which may be available. Rhodesia has, however, the advantage of being able to follow the methods now found most successful, and to avoid some of the initial mistakes

made by the older States. It also has the advantage of a considerable amount of excellent pioneer work in the formation of a number of plantations by private individuals, and as I have had the privilege of inspecting most of these, a short description of each may not be out of place.

MR. BROWN'S PLANTATION AT ARLINGTON, NEAR SALISBURY.

This plantation is on granite formation on high ground about three miles from Salisbury. A large number of varieties of gums have been tried, but only a few have been successful. *Eucalyptus saligna*, *E. citriodora* and *E. botryoides* are very good. Mr. Brown has now a flourishing plantation of about 50 acres. In one part, where fire has passed through, even the best varieties are stunted. From the appearance of one or two *Cupressus* and *Callitris* near the house, this position would give good results with them also.

MR. PICKETT'S PLANTATION, PENHALONGA.

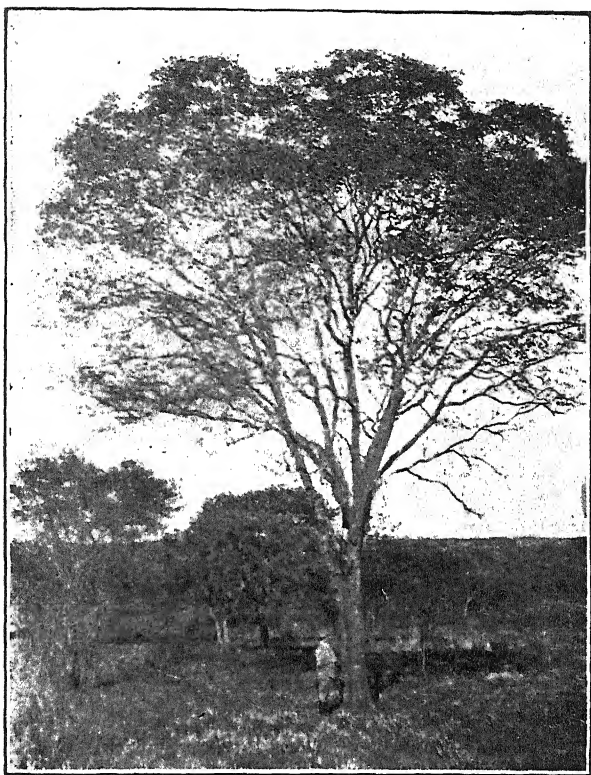
This is purely a gum plantation of about 50 acres and fire has severely damaged part of it. A considerable variety has been planted and the result is a very successful plantation. It is situated on rich formation soil.

PLANTATIONS AT PENHALONGA MINES.

There are two plantations almost entirely of blue gum, (*E. globulus*). The one is situated in the valley and the other in a recess in the mountains. The soil is deep and friable, the district well watered and the rainfall good, which may account for the success of blue gum in this locality. The trees are very good, being about 60 feet high and 10 and 11 years of age.

MR. STRICKLAND'S PLANTATION, PENHALONGA.

This plantation is on the lower slopes of the mountains and the growth is the best seen in the country. The oldest trees are only six and seven years old, and both Black Wattle and *E. saligna* are 60 to 70 feet high and very healthy. The soil is a brown loam of considerable depth, probably dioritic with an intrusion of dolerite.



Dhlandhlovu (Pterocarpus sericeus).

MOUNTAIN HOME PLANTATION, MR. J. MEIKLE.

This is one of the best managed plantations seen. It is on similar soil to Mr. Strickland's, but at a higher elevation. It is divided into blocks and care taken to exclude fires. A fair variety of *Eucalyptus* have been tried, of which *E. saligna*, *E. globulus*, *E. citriodora*, *E. robusta*, and *E. botryoides* are among the best. A very fine block of *Acacia melanoxylon* was perfectly healthy and making good growth. Black Wattle (*Acacia decurrens*) was also good. A few conifers also had been tried, and a block mostly of *Cupressus lusitanica* but containing several other varieties was also extremely healthy and deserves to be extended. A number of gums had been cut at nine years old for the mines, and the coppice re-growth is excellent. The area of these plantations is about 150 acres.

MR. MCADAM'S PLANTATION ON THE ESCARPMENT.

Probably the largest area of planted trees in Rhodesia, extending to about 300 acres, is situated on poor granite soil and is not so satisfactory as the last two mentioned. The choice of situation was however unfortunate, having been selected on level ground easy to plough, on a rather bare plateau. A large proportion of the plantation was under Black Wattle which were only fairly satisfactory and were damaged by or had been affected with aphis. Blue gum was diseased in patches but otherwise had made good growth. A block of Melanje cypress which at all other places had been badly attacked by aphis or phyloxera, was healthy and made good growth. On the whole the plantation was satisfactory considering the situation.

PLANTATIONS AT MR. RHODES'S ESTATE, INYANGA.

The plantations here rather take the form of shelter, and ornamental belts greatly improve the appearance of the estate. The soil is a poor granite one but of considerable depth and except in very exposed places, appears very suitable for tree planting. In all, some 36 species have been tried, and although some have failed, the plantations as a whole are successful. Melanje cedar, although indigenous to the adjoining mountain gorges, was a complete failure, while exotic *Cupressus* and *Callitris* were growing luxuriantly. Pines of several varieties had been tried without much suc-

cess, but a small area sown *in situ* last year with *P. pinaster*, *P. halepensis* and *P. canariensis* looked promising. *A. decurrens*, particularly *in situ* sowings, was growing well but are infested with scale. Several belts of gums are very satisfactory.

ENGLISH CHURCH MISSION, PENHALONGA.

A considerable area was planted round the Mission Farm wherever a piece of ground was unsuitable for cultivation. The soil was poor granite loam, but most of the blocks were fairly successful, chiefly eucalypts. Several small plots of conifers were also promising, especially Junipers and Cupressus. Pines were fairly good only and Melanje cedar a failure. *Cupressus torulosa* had been used as a wind break round the garden below the homestead, and was all that could be desired, while another block of 25 rows of the same, planted 6 ft. square to protect an apple orchard was excellent for the purpose and the growth was good. On a very exposed ridge, a plantation of gums, pines, callitris and wattle had been planted, but although mostly growing, were badly twisted by the wind.

MR. MATHEW WHITE'S PLANTATION.

This plantation is situated on exceedingly poor ground on the farm "Agnes," high up on the escarpment with a heavy rainfall. A considerable number of trees had been planted. Fire had been several times through. In spite of this, however, Black Wattle and several gums in a small block looked very promising, and some isolated trees were struggling for existence.

MATOPOS PARK, BULAWAYO.

This is not so much a plantation as a park, but parts are now being put down as close plantation. It is situated on poor granite soil among the kopjes of the Matopos and has an average rainfall of about 22 inches. A large variety of trees, indigenous and exotic have been tried, and it is surprising how many have done well. The Curator in his report for 1909 gives a very full list of the trees he has tried, and it would be invidious to repeat them here. It comprises 135 varieties of exotics and twenty indigenous trees. Although a number are not thriving and will probably eventually die a large number are very promising and the experiments are valuable.

MR. WREY'S ARBORETUM, BULAWAYO.

Situated on hard granite kopje, Mr. Wrey has got a considerable number of trees to do well, but the treatment is too expensive for economic afforestation. It is, however, a most useful and interesting experiment. Various *Cupressus*, *Callitris*, pines and junipers have been tried on plots of trenched soil and are almost all looking healthy and promise to make nice trees. A small area, however, was planted on ploughed land and some of the trees here are almost, if not quite, as good as those in the trenched plots.

In the parks at Bulawayo, Salisbury, and Umtali, a fairly large variety of trees are growing successfully, especially at Umtali. In the Government Avenue, Bulawayo, *Pinus halepensis* and some *Cupressus* have made good growth.

The plantations are nearly all, however, either on granite soil or under a heavy rainfall of the escarpment and supply data as to the trees suitable for the heavy formation soil or the sandy soils of the sandstone belt.

At the small Government Experimental plantation at the Nursery farm, however, a considerable variety of trees have been tried on the stiff soil, and are a guide as to future experiments on a large scale.

The success of these private plantations prove the possibility of growing exotic trees with success and there is no doubt that plantations of both exotics and some of the indigenous trees can be successfully established.

SITES FOR PLANTATIONS.

In forming a plantation, the first important point is the choice of a site, which requires great care as on it a considerable part of the future success or failure of the undertaking depends. In this report, therefore, no attempt is made to indicate anything more than localities which appear to possess areas suitable for tree planting. The soil should be carefully examined as to depth and texture. It should be friable deep and fairly retentive of moisture, but need not be rich. Stiff soil and any soil with a stiff clay bottom should be avoided. Sandy soils are usually good for plantation. In France, Germany, and on the Cape Peninsula very successful forests have been established on almost pure sand. Mountain slopes are almost invariably covered with trees, and experience in South Africa and elsewhere has taught us that such positions are amongst the most suitable for plantation work.

A certain amount of shelter is also desirable for many varieties, and although many trees can be successfully used to form wind-breaks, the best timber and most successful plantations can usually be grown in localities sheltered from prevailing winds.

The rainfall should be considered, and if under 25 inches great care will be necessary in the selection of species. The general vegetation of the district, and especially the growth of trees, indigenous or exotic, should also be made a guide to the probabilities of any proposed site.

The position with regard to markets and facilities for utilising and dispatching the timber should be considered; sites near the railway or near mining centres should therefore have preference, other things being equal, but it must be remembered that this will not make up for unsuitable soil which will not grow trees.

Localities which appear to me to possess the necessary qualifications are the following:—

1. The mountain slopes of the escarpment, particularly near Umtali, Penhalonga and Cloudlands and on to Inyanga if very exposed positions are avoided. Also, from information received, the mountains from Umtali to Mielsetter.
2. The valleys and mountain slopes in the kopje country south west of Odzi.
3. The slopes of the kopjes in the vicinity of Rusapi and probably the light sandy soil at Marandellas.
4. The hills around the Mazoe Valley, taking the Iron Mask as typical.
5. Valleys and slopes in the Hunyani Hills, the farm Dingley Dell being taken as a typical example.
6. The granitic sandy soil lying towards the hills to the east of Somabula towards Selukwe. A trial should also be made on the flats which require tree shelter.
7. The sand belts on which the teak grows near the Gwaai River, if water can be got for nursery work and also the sand belts at Ingondomo Valley.
8. The kopjes and tableland near Gatooma from which a considerable quantity of Mashuma has been cut.

There are no doubt many other situations which may also be suitable and at which experiments should be made.

As is seen from the above selection, conservation of woodlands and formation of plantations should scarcely interfere with farming operations as the most suitable soil for plantations is not usually of a nature to suit the farmer. Indeed, on many farms stretches of soil occur well adapted for plantations, the planting of which might be a profitable investment.

MANAGEMENT OF PLANTATIONS.

A good deal of experiment is necessary, but it would appear as if thorough cultivation, close planting or sowing so as to quickly protect the soil and afterwards thinning out as is found necessary, is the system to follow with almost all species. Plantations must be thoroughly protected from fire as recommended for the forests. Compartments of varieties liable to fire should be comparatively small and surrounded by strips of less inflammable varieties which should also be planted round the boundaries. In areas which have been denuded of timber the method suggested is the cultivation of the ground, the removal of undesirable species and assistance to regeneration by seeds or plants either of the better varieties or of exotics.

TIME REQUIRED TO PRODUCE TIMBER.

The present generation, however, is in haste to be rich and look for quick returns, and I would fail in my duty did I not throw out a word of warning. Good serviceable timber cannot be grown in ten to twelve years. To cut timber for mine work, as is being done, even if it is big enough, is not fair to the timber, as at this age it has little heart wood or durability. It is possible to begin getting a return from thinnings or from Black Wattle in localities where it will grow, at about ten years, but for the timber crop twenty, forty or even fifty years may be necessary to obtain mature wood. It is not always profitable, however, to wait for maturity. Timber is a crop grown for profit and should be realised when there is a prospect of a good return. Opportunities to realise may be lost for an indefinite period if not acted upon.

PLANTATIONS BY PRIVATE INDIVIDUALS.

Private individuals, as has been shown, have in some parts of the country formed plantations very successfully, and there is no reason why this should not be extended, as in many places a plantation of trees on a farm is a most valuable asset. It beautifies the property and affords shelter to buildings and to stock. It will supply the timber required on the farm, and the surplus can be disposed of. The Government does something to aid and encourage individuals to conserve their forests and lay down plantations. For the past year or two young trees have been supplied at a nominal rate of Id. each. The planting of 3,000 forest trees is allowed to count as beneficial occupation of ground under a permit of occupation of ground under a permit of occupation, and a rebate of 5 per cent. is allowed on the agreed purchase price for every 3,000 forest trees of approved varieties well established. This is not much taken advantage of, principally, I think, from want of knowledge as to how to set to work.

PLANTATIONS BY MINING AND OTHER CORPORATIONS.

Mining and other Corporations have much land lying idle, part of which might well carry a crop of trees. Two methods are open to them. (1) regeneration of denuded areas by protecting the re-growth and filling up with seeds or plants of the best varieties of exotics; (2) the formation of plantations of quick growing trees so as to supply the mines with timber and fuel. Frequently such owners have denuded the ground for the use of their own mines, or otherwise profitably disposed of it, and they might well try, if not to replace the whole, at least to grow as much as is required in the immediate neighbourhood. They would eventually find this a profitable investment.

SPECIES TO PLANT.

In his report on the Matopos, Mr. Huchins gave a very complete list of the trees suitable for experiment, and in his paper on Tree Culture in Southern Rhodesia, Mr. P. B. S. Wrey also gives a useful list. I therefore think it unnecessary to repeat these as they are available as a guide to experimental work, and here will confine myself to the description of a few trees which I find doing really well in the country,

and which should form the basis of the earlier plantations. It should be borne in mind that success in forestry does not depend upon the number of species, but upon having a few which can be depended upon.

Acacia decurrens. Black Wattle.—This tree gives the valuable tan bark exported in large quantities from Natal. It also gives serviceable mining timber in a very short period. It grows well on the mountain slopes in good soil near Penhalonga and on granite soil at Inyanga. So far, I have not seen it satisfactory away from the region of heavy rainfall.

Bambusa Sp. Bamboo.—A species of bamboo from the Zambesi is doing very well in the dry land at Sinoia and is worth cultivation for whip sticks.

Callitris calcarita. Cypress Pine.—An Australian tree doing well in the Nursery Farm, Salisbury, at Penhalonga, Inyanga and the Matopos. It is a cedar timber, strong and durable. Several other *Callitris* are also doing well and are worth cultivation such as *C. robusta*, *C. verrucosa*, *C. quadrivalis*.

Cedrilla toona, Toon.—A Himalayan tree. It is doing well at Salisbury, Matopos, and Umtali. The timber is not hard, is easily worked and is not eaten by white ants. This tree grows quickly and appears to suit many localities.

Cupressus elegans.—Very good at Matopos and at Bulawayo. Good timber and a very handsome tree.

Cupressus lusitanica. Cedar of Goa.—At Mr. Meikle's plantation at Penhalonga, also at Salisbury and Matopos. Suffered through drought in Bulawayo. Timber is like cedar and the trees grow rapidly.

Cupressus torulosa.—Growing well at Inyanga. Not apparently tried elsewhere. Good cedar timber and a very handsome tree.

Cupressus sempervirens. Common Cypress.—Hardy, grows well at Matopos and Bulawayo, but is disappointing at Salisbury. The timber is good. Several other *Cupressus* were seen as individual specimens growing well and all are worth a good trial as they are good timber trees and appear to suit the country. The *Cupressus* are likely to be valuable as they

grow in most places, are very ornamental and the timber is excellent for house building, mines, wagon building and cabinet work.

Dalbergia sissoo. *Sisu Tree*. Himalyan tree growing well at Salisbury and Gwibi Reserve, also at Bulawayo and Matopos. Sisu timber is valuable, dresses well and does not split or warp. This is likely to be one of the best trees of the country.

Eucalyptus botryoides. *Bastard Mahogany*.—Has done well in granite at Mr. Brown's, Salisbury, at Penhalonga, at Inyanga and fairly well at Matopos.

E. citriodora.—One of the few Eucalypts which has done well all over the country. It is good on granite, on formation and on the fertile slopes at Penhalonga. The leaves are lemon-scented and the timber is good. *E. maculata* resembles this tree very closely but the leaves are not scented.

E. etimia.—This is one of the best gums at the Matopos and should therefore suit granite country. It provides a good timber.

E. pilularis. *Black Butt*.—This tree has done well at Inyanga, Penhalonga and fairly well at the Matopos. Suits the damper localities but grows fast and provides a useful timber.

E. polyanthemus.—Is growing well wherever it has been tried. It is inclined to branch and makes a good avenue tree. The timber is said to be excellent for mines.

E. resinifera and variety *grandiflora*.—These trees are both growing well on the escarpment and equally well at the Matopos. The timber is first class.

E. rostrata. *Swamp Gum*.—It is not very satisfactory at Penhalonga, but elsewhere it is one of the best. The timber is hard and durable and suitable for mine work.

E. saligna.—This is probably the most generally successful gum in the country. It grows fast and would be suitable for planting up denuded areas on the gold fields for quick returns of mining timber and fuel. The timber is good. It is, however, inclined to lose its top on level formation ground.

E. sideropholia, *E. sieberiana* and *E. sideroxylon*.—These are all iron bark gums and are doing well in most localities, are well worth growing for their valuable timber, although their growth is slower than most eucalypts.

E. teriticornis. *Red Gum*.—Hardy. Has only been tried at the Matopos and near Salisbury where it is doing very well. It provides a good timber.

Grevillia robusta. *Silky oak*.—Is growing well everywhere, but is inclined to branch low and in exposed positions to bleed. The timber is excellent for furniture, etc.

Juniperus Bermudiana, *Juniperus Mexicana*, *Juniperus Virginia*. *Pencil Cedar*.—These trees are all slow growing but give excellent timber and are doing well in the few places where they have been planted.

Pinus Canariensis, *Canary Island Pine*.—Has done fairly well at Mr. Wrey's arboretum, Bulawayo, at the Matopos Park and in the park at Umtali. It is one of the best Pine timbers.

P. halepensis, *Aleppo Pine*. Is so far probably the most successful pine, especially at Bulawayo and the Matopos and fairly good at Salisbury.

P. pinaster.—Promises well in places, but in others a complete failure. It has not been much tried, and cannot be recommended without further trial.

P. longifolia, *Chir Pine*.—This Himalayan tree is doing well at Inyanga, the Matopos and Bulawayo. It is worth extended cultivation.

All the pines are doing only moderately well and should be used with caution.

Populus Alba.—Is growing well at Penhalonga and near Salisbury. Said also to do well at Melsetter, and provides a good useful soft timber, used for boxes and for match making. It thrives best on the banks of streams.

Pteroxylon utile, *Sneczewood*.—This is one of the most valuable trees in the eastern Cape Forests. The timber is practically everlasting as posts for kraals or fencing. It is growing very well at Mr. Wrey's arboretum, at Matopos Park and a solitary very healthy tree is growing on a formation

kopje at "Glenbervie," Mazoe. It is worth extended trial on the stony slopes of the kopjes.

Many other trees have done well in some places and poorly in others and should be planted experimentally, but the above list is quite enough as a basis for future work.

WATTLE GROWING AND TAN BARK.

The growing of wattles to supply tan bark could only be carried on the better soil of the mountain ranges from Melsetter to Inyanga with any prospect of success. Near Penhalonga the growth of wattle was equal to any I have ever seen in Cape Colony, but the area appears to be limited as

I have not seen it satisfactory anywhere away from the escarpment, and there is not much prospect therefore of developing an industry. It is, however, worth trying at Selukwe and other places where the rainfall is good.

The bark of the *Brachystegias* is very astringent and might give a good bark. A parcel of one variety was sent by a private individual to London for experiment and a favourable reply was received. The matter, however, ended there. These trees are plentiful all over the country and grow easily, and it appears well worth while having the matter fully investigated.

The bark is fit for stripping at from six to eight years of age, or if the wood is of value for mining poles it may be left for ten or twelve years, which greatly improves the timber. It should be taken, however, as soon as the bark begins to turn rough and black, as the quality then deteriorates.

An average crop of bark in the Cape Colony and Natal is four to five tons per acre, and on very good soil exceeds this at about eight years of age. A thinning is frequently stripped at about five or six years, yielding one or two tons. The espacement must be wide enough at all times to keep the trees growing vigorously or they become bark-bound if they do not have enough room; ten to twelve feet is usual for the final crop.

The price of bark is usually about £6 per ton f.o.b., and the cost of stripping and bagging about £2 per ton.

Hints on Irrigation.

SMALL GRAVITATION SCHEMES.

By W. M. WATT, Government Agricultural Engineer.

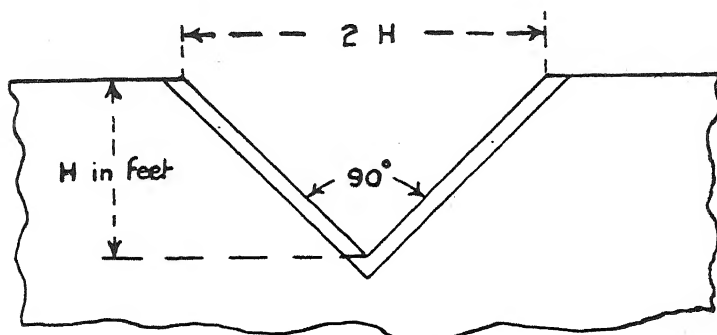
In treating of this subject it is proposed to place a few points before our farming community, which may be of use to them in laying out small gravitation schemes.

The first point is to decide whether the project is a feasible one, and in this connection we have several very important factors to consider, viz.:—(a) Have we a permanent supply of water? (b) Have we a sufficient area of good irrigable land? (c) Has the river and valley sufficient fall to enable us to command our irrigable land by gravitation? (d) Are we likely to have a ready market for our produce? (e) What will be the probable cost of the scheme, and is it likely to prove remunerative?

Dealing with these points in order, we will first consider the all important question of water supply. This may come from a stream, a spring or storage dam. The supply may be much in excess of that required for the irrigable land available, but if the supply is much less than that which would be required for all the land available, it may be advisable in order to cut down the cost of our works, to lay out our scheme to suit our water supply. To do this, we have first to consider what is likely to be the month or period of the highest demand, i.e., the period in which the largest area of crops will require watering. This varies according to the crops

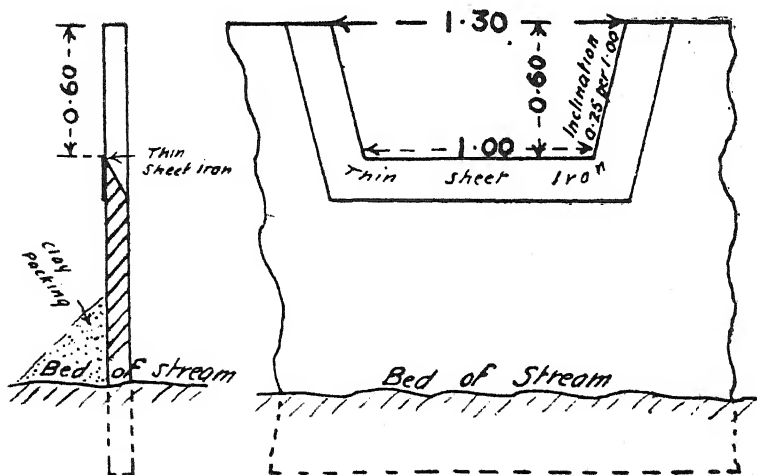
grown, the locality, etc., and each case will require as a rule, separate consideration. Should the stream become very low at the time it might be desired to give, say a final watering to a cereal crop, this would also have to be taken into consideration. Having decided whether the period of the highest demand, or the period of the lowest flow is to be the limiting factor, some means should be taken to measure our water supply at that period. For very small flows a simple and effective method is to throw a small dam across the stream so that all the water is cut off, and near the top of this to insert a pipe so that a bucket of known dimensions can be inserted under the outlet of the pipe. The number of buckets full over a timed period, the longer the better, will by a simple calculation give us the number of gallons running, per second, per minute, per hour, etc. In order to convert gallons per second into cusecs (cubic feet per second) divide by 6.24. In this connection care should be taken that the dimensions of the bucket are in, or are reduced to Imperial gallons. The U.S.A. gallon is in common use, but it is smaller than the Imperial gallon; 1 (one) Imperial gallon equals 1.2 U.S.A. gallons. For measuring larger flows than can be dealt with in the foregoing manner, notch gauges should be used. For discharges up to 2 cusecs (cubic feet per second) a triangular notch is suitable. This contrivance should be made from well-seasoned wood, and a right angled notch should be cut out of it in the manner shown in the accompanying sketch No. 1. The edges of the notch should be chamfered to an angle of 60° , and when placing in position the sharp edge of the chamfer should be up-stream. The notch should be placed in a straight stretch of the stream, so that the water behind is dammed-up in a still pond, and great care should be taken that all the water is forced to discharge itself over the notch and that no water leaks round the sides or underneath. A clear fall of at least 12 inches should be available immediately below the notch so that there is no tendency to drown it by the water downstream. The notch should be fixed at right angles to the flow, and so erected that a line passing through the apex of the notch, bisecting the right angle, will be truly plumb. The discharge over such a notch is dependent upon the depth of the water flowing over it, and is given in the accompanying table. In order to accurately measure the depth of the water over the notch,

— SKETCH No 1 —



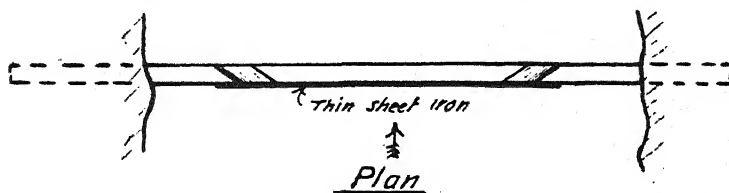
Elevation

— SKETCH No 2 —



Section

Elevation



Plan

a gauge post carefully marked in feet and decimals of a foot should be erected in a pond about 3 feet above the notch, so that the zero of the gauge post should be level with the apex of the notch. This post should be truly vertical. The following table gives the discharge corresponding to different depths over a triangular notch weir:—

Height.	Disch'ge	Height.	Disch'ge	Height.	Disch'ge	Height.	Disch'ge
ft. dec.	cusecs.	ft. dec.	cusecs.	ft. dec.	cusecs.	ft. dec.	cusecs.
0'1	'01	0'44	0'33	0'65	0'87	0'86	1'74
0'2	'04	0'45	0'35	0'66	0'90	0'87	1'79
0'25	'08	0'46	0'37	0'67	0'93	0'88	1'84
0'26	'09	0'47	0'39	0'68	0'97	0'89	1'89
0'27	'10	0'48	0'41	0'69	1'01	0'90	1'95
0'28	'11	0'49	0'43	0'70	1'04	0'91	2'00
0'29	'12	0'50	0'45	0'71	1'07	0'92	2'05
0'30	'13	0'51	0'47	0'72	1'11	0'93	2'11
0'31	'14	0'52	0'50	0'73	1'15	0'94	2'17
0'32	'15	0'53	0'52	0'74	1'19	0'95	2'23
0'33	'16	0'54	0'55	0'75	1'23	0'96	2'29
0'34	'17	0'55	0'57	0'76	1'27	0'97	2'35
0'35	'18	0'56	0'60	0'77	1'31	0'98	2'41
0'36	'20	0'57	0'62	0'78	1'35	0'99	2'47
0'37	'21	0'58	0'65	0'79	1'40	1'00	2'54
0'38	'23	0'59	0'68	0'80	1'45	1'01	2'60
0'39	'24	0'60	0'71	0'81	1'49	1'02	2'66
0'40	'26	0'61	0'74	0'82	1'54	1'03	2'73
0'41	'27	0'62	0'77	0'83	1'59	1'04	2'80
0'42	'29	0'63	0'80	0'84	1'64	1'05	2'87
0'43	'31	0'64	0'83	0'85	1'69	1'06	2'93
						1'07	3'00

Where the discharge of a stream exceeds 2 cusecs, the best means for measuring its flow is by means of a trapezoidal weir, such as that known as the Cippoletti weir, a drawing of which is shown on sketch No. 2. The method of erecting this weir is essentially the same as that required for the triangular notch, except that the clear overfall should be increased to 18 or 24 inches where greater depths than six inches over the sill are anticipated. Should there be no clear overfall the figures given in the tables will be valueless. The following table gives the discharges over a Cippoletti weir for different lengths and depths,

Depth of Water on Crest.		Discharge in Cubic Feet, per Second.							
In Inches.	In Feet.	1 Foot Long.	1½ Feet Long.	2 Feet Long.	3 Feet Long.	4 Feet Long.	5 Feet Long.	7 Feet Long.	10 Feet Long.
3	025	0135	0202	0269	0404	0539	0673	...	1347
6	05	0367	0566	0754	1131	1508	1865	...	3771
9	075	0690	1035	1380	2071	2761	3451	...	6902
12	10	1064	1596	2128	3192	4256	5319	...	10639
15	125	1488	2232	2976	4464	5952	7440	...	14881
18	15	1656	2934	3912	5868	7824	9780	...	19560
21	175	2464	3697	4929	7393	9858	12322	...	24044
24	20	3010	4515	6020	9029	12039	15049	...	30098
27	225	3592	5388	7184	10777	14369	17961	...	35922
30	25	4208	6312	8417	12625	16833	21041	...	42083
33	275	4855	7282	9709	14564	19419	24273	...	48547
36	30	5531	8297	11063	16594	22126	27657	...	55314
39	325	6238	9358	12477	18715	24954	31192	...	62384
42	35	6972	10459	13945	20917	27890	34862	...	69724
45	375	7730	11595	15460	23100	30920	38649	...	77299
48	40	...	12777	17035	25553	34071	42588	...	85177
51	425	...	13993	18658	27987	37316	46645	...	93290
54	45	...	15240	20328	30492	40656	50820	...	101640
57	475	...	16534	22045	33067	44089	55112	...	110225
60	50	...	17854	23805	35708	47610	59512	...	119025
63	525	...	19210	25614	38420	51227	64034	...	128068
66	55	...	20599	27465	41198	54930	68663	...	137326
69	575	...	22018	29357	44036	58715	73393	...	146787
72	60	...	23472	31293	46939	62585	78231	...	156463
75	625	...	24955	33274	49911	66548	83185	...	166370
78	650	...	26462	35283	52924	70565	88206	...	176413
81	675	...	28007	37343	56014	74686	93357	...	186715
84	70	...	...	39437	59156	78874	98593	138030	197186
87	725	...	...	41565	62347	82930	103912	145457	207824
90	75	...	...	43733	65599	87466	109332	153065	218575
93	775	...	...	45942	68912	91883	114854	160796	229708
96	80	...	...	48177	72265	96354	120442	168619	240885
99	825	...	...	50453	75679	100906	126132	176585	252264
102	85	...	...	...	79154	105538	131923	184692	263846
105	875	...	...	...	82669	110225	137781	192893	275562
108	90	...	...	...	86234	114978	143723	201212	287446
111	925	...	...	...	89800	119800	129749	209649	299499
114	95	...	...	...	93516	124688	155860	218204	311720
117	975	...	...	...	97233	129644	162054	226876	324019
120	1000	...	...	...	101000	135667	168333	235667	336667
123	1025	...	...	...	104808	139744	174679	24451	349359
126	105	...	...	...	108656	144888	181110	253554	362220
129	1075	...	...	...	112575	150100	187624	262674	375249
132	110	...	...	...	116524	155365	194206	271888	388412
135	1125	...	...	...	120513	160684	200855	281198	401711
138	115	...	...	...	124553	166071	207588	290624	415177
141	1175	...	...	...	128644	171525	214406	300168	428812
144	120	...	...	...	132764	177019	221274	309784	442548
147	1225	...	...	...	136936	182581	228226	319517	456453

Another method of ascertaining the discharge of the stream is by measuring the velocity of the flow by means of floats, and multiplying the velocity in feet per second thus found by the cross-section of the water area in square feet; the product will be approximately the discharge in cusecs (cubic feet per second).

In order to get a fairly accurate result by this method, a straight uniform reach should be selected, free from such obstructions as weeds, large boulders, etc. A run of 20 feet should then be laid out and marked off by reeds on both banks, the opposite reeds at the upper and lower end of the reach should be at right angles to the stream. In the centre of this run a third line should be marked off and its cross-section determined by measuring the depth at regular intervals across the stream. The mean of these depths multiplied by the distance across, will give the area of the cross-section of the water. To ascertain the velocity, throw into the stream a few feet above the upper mark, any floating object which while visible, will not stand too high out of the water to be unduly affected by wind, and as it floats downstream, ascertain by means of the seconds hand of a watch, the time it takes to traverse the 20 feet between the upper and lower marks. This operation should be repeated several times at different distances from one bank and the mean of the times taken. The velocity is found by dividing the length of the run in feet by the average time in seconds, the quotient will be the velocity in feet per second. For instance, suppose the average time taken by the floats to traverse a 20 foot run was 10 seconds, the velocity would be 2 feet per second. The velocity however, is only the mean surface velocity and as there is friction along the sides and bottom which cause the velocity there to be much lower, it will be necessary to make some allowance. In order to do this, multiply the mean surface velocity by 0.8, the result should give a near approximation of the true mean velocity. Having thus arrived at the mean velocity, multiply this by the area of cross-section of the water in square feet as previously determined, and the result will be the discharge in cusecs (cubic feet per second).

Having gauged our stream, we have something to guide us in estimating what area of ground our water can irrigate. It might here be mentioned that for large works, such gauging

should be carried on over a period of several years, but for a small work, a few gaugings in any normal year should be sufficient guide, especially when the farmer is more or less acquainted with the vagaries of the flow of the stream in question. Assuming then that by one or other of the methods of gauging the flow, we find that we have one cusec flowing at the critical period of the year, i.e., either the period when the largest area of crops require water, or the period when we wish to give a final watering to some crop and our stream is at, or near its weakest, we have to decide what is the largest area we can safely put under irrigation.

In order to get the most economical results with our water, it will be found advisable to grow a variety of crops which may not all require watering at the same time, but to elucidate the method of arriving at the area we can irrigate, let it be assumed we are going to grow a cereal such as wheat. Suppose then that we have to give a final watering to our whole area of wheat somewhere between September and October and that we have one cusec available for the purpose. In order to get the full use of this supply, we will either have to irrigate right through the night or make some arrangement for storing our night water for use next day; the latter arrangement will generally be found most convenient. We will then have two cusecs running for twelve hours each day, if we omit absorption and evaporation losses.

In an article such as this, it would be impossible to go fully into details as to how absorption and evaporation are allowed for, and in the case of small canals this would be unnecessary, as the majority of irrigating farmers will be able to make a pretty shrewd guess as to what proportion of the water is likely to be lost in transit. In order to avoid fractional figures I shall assume that we have no losses. As 12 hours is equal to 43,200 seconds, 2 cusecs would be equivalent to 86,400 cubic feet per day of 12 hours. There are 43,560 square feet in an acre, consequently an acre covered one square foot deep represents 43,560 cubic feet. A 4 inch watering is a third of this, i.e., 14,520 cubic feet. We have 86,400 cubic feet available, and 86,400 divided by 14,520 gives us a quotient of approximately 6. That is, our 2 cusecs could give a watering of a depth of 4 inches—assuming that none

soaked away—to about six acres in one day. And as we have three weeks, or say 20 days in which to complete our watering, with this discharge, we would be able to give a final 4 inch watering to 120 acres in 20 days. As a rule it will probably be found more advantageous to give a heavier watering than 4 inches, but as a final watering to fill out the ears, this should be sufficient. In the earlier part of the season when the water is likely to be stronger, one 6 inches watering would probably go further and do more good, than say, two 3 inch waterings. From the foregoing we now see that we have sufficient water available to irrigate 120 acres of cereals, and if we can find other crops which will mature before the water runs so weak as one cusec, this area might probably be increased to 200 acres.

In the preceding paragraph, it was assumed that the available land was much in excess of our water supply. Let us now consider the land itself. Most of the arable soils in Rhodesia, are mechanically, well suited to irrigation. As a rule they have a free sub-soil which affords efficient drainage and prevents water logging. Brack is practically unknown. The lands should have a gentle slope to facilitate the construction of leading furrows, checks, etc., but if the slope is too great there is a danger of scouring. When the slope is very great and the depth of soil permits, the irrigable land should be terraced.

Most of our so-called black, chocolate, and red soils are very fertile and are suitable for irrigation, as also are some of the finer sandy soils found in the lower lying granite areas alongside of vleis, where they have in many cases received a strong admixture of organic matter. As a rule, however, the majority of the granitic soils will require periodical manuring. This fortunately is usually available, as the majority of farmers in the granite area go in for stock, and there is generally a fairly large amount of kraal manure to be had for the carting.

We now come to a very decisive factor in ascertaining the feasibility of a small gravitation canal. We assume we are assured of our water supply and irrigable land, and have now to find out whether we have sufficient fall in our stream above our land, to enable us to turn the water out and by a

small gravitation canal to let it run to a point which will command irrigable land. An engineer or other trained person, having a dumpy level could ascertain this very accurately in a minimum of time, but as engineers are not always available, it may be well to show here what any intelligent farmer can do for himself in this respect, with the aid of an ordinary carpenters spirit level and a straight edge, say 12 feet long.

In commencing this investigation we may be dominated by one or two things, i.e., we may be fixed to some definite point in the river for our point of offtake, owing to it being the only suitable one, or to it being a specially suitable one, or we may be fixed by some point on our land which it is necessary for us to command with our proposed furrow. In either case the method of carrying out the investigation is essentially the same, the one being merely carried out in the reverse order to the other; thus in the first case we would start operations from the point of offtake in the river and in the second case, from the point we desire to command. As an illustration I shall take the second case. A peg should be driven into the ground at the point we desire to command, and from this point it is first desirable to find the difference in level with the nearest point in the bed of the stream from which it is desired to irrigate—the course to be taken in levelling will generally be at right angles to the stream. To commence levelling operations, one end of the straight edge should be placed upon the peg and held there by an assistant, near the other end of the straight edge a spirit level should be tied, and by its means the straight edge brought to a dead level. The amount of fall is ascertained by holding a pole or rod about 5 feet long, marked off in feet and inches, vertically alongside the end of the straight edge. The fall thus recorded should be entered in a book. After this has been done the assistant should bring on his end of the straight edge and hold it exactly in the same spot that the measuring rod occupied previously, the operator at the same time proceeding on towards the river with his end, the fall is again ascertained by the measuring rod and recorded as before. By carrying this operation on in a series of steps, the fall from the peg at the commanding point on the irrigable land to the bed of the stream opposite, will be ascertained by adding all the recorded falls together. Should

there have been any rising ground between the peg and the river, the straight edge would have to be reversed so that the assistant is in front and the operator behind, the amount of rise is then found in exactly the same manner as described for finding the fall. The difference between the sum of the rises and the sum of the falls will give the total fall from the peg to the bed of the stream. Instead of taking the exact bed of the stream, the water level should be taken, as it is from this level that we shall carry on further operations. Assuming, by way of illustration, that we have found a total fall of 40 feet from the peg to the water level of the stream, we must now commence to work up the stream till we get a rise of 40 feet plus an amount to allow for the fall required for our furrow. The majority of our Rhodesian streams consist of a series of rapids separated one from the other by long lagoons, and, as during low flow the water in these lagoons may be taken as standing dead level, we shall be saved a good deal of work. It was for this reason that levelling down to the nearest point in the stream is recommended. Assuming now that our levelling operations brought us to the river in the middle of a lagoon, we would walk up this lagoon till we came to the foot of the first rapid. By means of our straight edge and spirit level, the total rise of this rapid to the water level of the upper lagoon should be found and recorded in our book, we should then traverse the length of the upper lagoon until we came to the foot of the next rapid, the rise of which would be again recorded and so on until we reach a point where we have over 40 feet rise, i.e., until we have struck a point in the river which is higher than the peg we left at a point commanding the land we desire to irrigate.

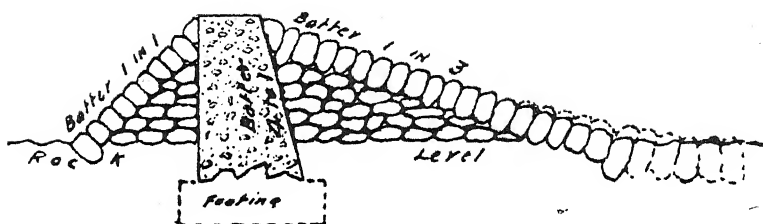
A further point which has to be considered is the question of markets. Where only a small acreage of crops is to be irrigated the question is not a serious one, as much of the crops grown may be consumed on the farm, but when we have to consider a fairly large scheme of irrigation a ready market for our products becomes a necessity, and will have a large bearing in deciding whether a scheme is likely to prove feasible. If the market is a purely local one it will not be safe to rely upon the current prices for any produce proposed to be grown on a large scale, if so, disappointment is pretty sure to follow. Individual cases will require in-

dividual consideration, and the economic position should be carefully studied, as the iron laws of supply and demand must be faced.

Having decided what crops we intend to grow and estimated the probable yield and return from them, we have next to try and estimate the cost of our irrigation works, preparing and fencing the irrigable land, etc., in order to ascertain whether our scheme is likely to prove remunerative. The cost of digging a furrow in ordinary soil should be estimated fairly accurately by any intelligent farmer who may know roughly what he might expect an average farm labourer to do in a day. Should there be any concrete work it may be taken that one and one-third casks of cement will be required to the cubic yard, when the concrete mixture consists of three parts of stone and two parts of sand to one part of cement, all measured by bulk. The remaining items of cost of the concrete consist in getting and breaking the stone, obtaining and washing the sand, mixing and shuttering, and laying in place. Having arrived at a rough estimate of cost, this should be compared with the probable return to be expected, and if the capital cost of the scheme is likely to be wiped off within ten years (allowing also for a sufficient margin of profit in the meantime to more than cover ordinary working and maintenance charges) the work may safely be embarked upon.

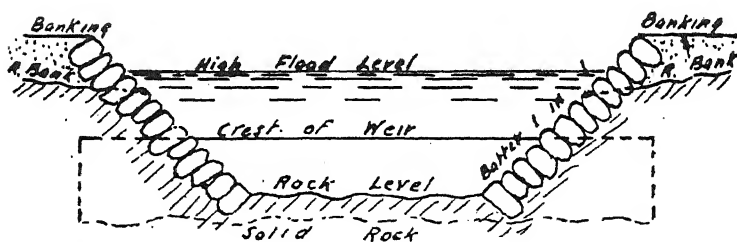
In selecting a site for our head works it will generally be found advisable to search higher up the stream than the point found by our levelling operations to be at a sufficient elevation to command the irrigable land, as, if we get unnecessarily high with the furrow we can always institute a series of drops; by searching lower down stream we might be forced to construct a high diversion weir in order to retain command of the land. The points to look for in selecting a site for a weir and for diverting the water are:—(1) to obtain a point where all the water in the stream can be cut off, a solid rock bottom if possible, and failing that, a good sound clay bottom; (2) to search for a point in the stream below which we have a rapid fall, so that we can carry our furrow out of the influence of floods in as short a distance as possible. It is also an advantage to have a long lagoon above the point of diversion, as some storage might then be obtained

— SKETCH NO. 3 —



Cross Section

— SKETCH NO. 4 —



Longitudinal Section

by raising the diversion dam, and ; (3) the banks should be low and not too steep, it is generally preferable to have rock on both sides of the river as there is then no chance of the river finding a new channel round the flanks of the diversion weir, and it is also much easier, though possibly somewhat costly, to make our headworks of a permanent character. It will only be in rare cases that all these desirable features will be found together, but they should serve as a guide in searching for the best site.

Having selected a site for our weir we have now to consider construction, and whether the headworks are to be of a permanent or temporary nature. In Rhodesia as a rule, we only require to irrigate after the rainy season when the rivers have returned more or less to their normal conditions of flow. Taking this point into consideration it may prove more economical in many cases to construct a weir of a purely temporary character, which may be washed away each wet season, and re-constructed again after the floods have subsided and when there is no fear of further rain. A temporary weir may be constructed of sand bags, backed up by good impervious ground on their up-stream face—means should be found if possible to lay this ground dry, so that it can be properly rammed and consolidated. Crabs are apt to do a good deal of harm in banks of this nature, but a 12 inch layer of dry kraal manure mixed with a little dry slaked lime, helps as a preventive against their burrowing. It may, however, be deemed advisable or more economical to construct permanent headworks. A suitable design for a small diversion weir up to about 6 feet in height is shown on the accompanying sketch (No. 3). The concrete core acts only as a barrier to the water, the stone packing gives the weir stability. The concrete should not be mixed weaker than 5 to 1, or say, 3 of stone and 2 of sand to 1 of cement. The stone should be hard and durable and broken into angular pieces which will pass through a $2\frac{1}{2}$ inch ring and be retained by a $1\frac{1}{2}$ inch ring. The sand should be fine and sharp, and if not absolutely clean, should be soured in clean water until all muddiness disappears. The cement should be of the best Portland cement obtainable. In mixing the concrete, the sand and cement should be first mixed dry, in their proper measured proportions, by turning them over together at least twice, the broken stone ballast should then

be added and the whole mixture again turned over twice. Water should then be added lightly from a watering can fitted with a rose, and the whole mass turned over until it is thoroughly mixed and is of such a consistency that after sticking in and withdrawing a mason's trowel the mass will quietly and completely close up the hole left by this operation. A portion of the wooden shuttering or framing for the concrete should previously have been set in place, and into this the concrete should be turned with as little delay as possible. Once the concrete mixture has been wetted, every minute's delay in placing it *in situ* may mean a considerable reduction in its strength, and after 30 minutes delay in laying in place, an average cement concrete will be absolutely useless. The concrete should be carefully deposited and not dumped into the shuttering, as by dumping it the ballast will separate from the sand and cement, and an unsatisfactory job will be the result. Furthermore, no concrete should be set in running water, as the finer cement particles are apt to be washed away. If this cannot be avoided a much higher proportion of cement must be used in the mixture. While the concrete is being deposited in the shuttering it should be well rammed with a pick handle or similar tool, so that no cavities or air holes are left in the work. When adding new concrete to old concrete the surface of the old material should be roughened with the point of a pick and the surface cleaned and slightly wetted. While the concrete is setting it should be kept damp and covered with grass, etc., to keep it sheltered from frost and sun. After the concrete has been set for from one to two days, the shuttering can be carefully removed. The shuttering may consist of Oregon pine boards, well shored on the outside to prevent bulging. The stone packing must be carefully laid by hand and be of the largest blocks obtainable. The facing stones should be laid on end, perpendicular to the slope, spauls (small stones) should be driven firmly into all interstices between the larger blocks, so that the whole packing may be as rigid and solid in character as possible. This weir is chiefly suited to a rock foundation, but may be used on a good clay foundation if proper precautions are taken. With a clay foundation the concrete core will require a footing as shown dotted in sketch No. 3, and an apron of stone will also require to be carried some 20 feet or so below the downstream toe in order to prevent the weir being under-

mined by scour. This apron is also shown dotted on the sketch. When there is any danger of flood water outflanking the weir, this should be prevented by constructing training embankments as shown on sketch No. 4, and the ends of these embankments should be protected by rip-rapping with stone. Whether the weir be of a temporary or permanent character it is always desirable to have a regulating sluice gate near the headworks. This sluice should be so designed as to stop all water entering the furrow if desired, and to enable us to control the inflow of water at all times. It should be so situated that no flood water can possibly get into the furrow from the stream below the sluice gate. It is sometimes an advantage to erect a scour sluice on the down side of the furrow, immediately above the regulator, as by its means the weir and upper reach of the furrow can be cleaned of sand and other deposits. The stretch between the furrow and the regulating sluice should be protected by dry stone pitching or otherwise, so that the chance of it being washed away is reduced to a minimum.

We have now to decide on the dimensions of the furrow. In a large scheme irrigating several thousand acres, the main canal would become gradually smaller in section towards its end as the water would be drawn off at intervals along its length for the irrigation of different areas, and as allowances for absorption and other losses decrease, but with a small furrow of a mile or two in length and the land fairly concentrated near its end, we may construct our canal of one dimension throughout. Assuming that we have found by measurement that our irrigable area is 200 acres in extent, and that we wish our channel to be *capable* of carrying sufficient water to give a six inch watering to the whole area in 20 days of 12 hours each. This means 10 acres would have to be supplied with sufficient water to cover it in 12 hours 6 inches deep, if none of the water soaked away. A six inch layer of water, as may be calculated from data already given, equals 21,780 cubic feet, and as there are 10 acres to be covered in a day of 12 hours, 217,800 cubic feet are required per day. Now 12 hours is equal to 43,200 seconds, so that the quantity of water required per second will be 217,800 divided by 43,200, the quotient of which gives our requirements as a little more than 5 cubic feet of water per second,

which for brevity sake is called 5 cusecs. To allow for losses in transit and for the growth of reeds, etc., it will be safer to design our furrow to carry 6 or 7 cusecs. Our headworks being so situated as to command our irrigable land with sufficient fall to spare in grading our furrow, we may now fix on our dimensions and grades. A question very frequently asked by farmers is:—"What fall should I give to a furrow?" To retort by asking the size to which pumpkins grow, would probably fit the question. The fall to be given to a furrow depends upon a great variety of circumstances. In rock we can give our furrow as much fall as we please, and in large canals the fall given in rocky country is frequently increased so that the section of the canal may be reduced and in consequence the amount of rock cutting. In soil, if we give too great a fall to the canal, the velocity of the water would be too high, and erosion of the sides of the channel would be continually taking place. Again, if we give too small a fall, there will be the danger of reeds growing and choking our furrow and the water may not have sufficient velocity to carry in suspension the finer silts which are so valuable as a fertilising agent. In grading our furrow we should aim at getting a velocity which will be swift enough to prevent the growth of reeds and capable of carrying fine silt in suspension, and yet not swift enough to erode the sides of the channel. Such a velocity is termed the critical velocity, and it will vary with the mechanical nature of the soil through which our furrow may be cut. Large canals may have falls of one foot in 10,000 feet and attain the same velocity as small furrows with falls of one foot in 1,000 feet. The dimensions of the canal therefore have an important bearing on the grade to be given. The formulæ used in calculating the velocity and discharge of channels for different sizes and grades, are rather too complicated to be given here, but the following list of discharges, while not very comprehensive, may serve as a guide, and the writer will at all times be pleased to work out the correct dimensions of a furrow, if any farmer cares to write giving the necessary data to work from.

TABLE giving the velocity and discharge of furrows of different dimensions and grades.

The sides of the furrows being sloped $\frac{1}{2}$ to 1.

Grade.	Bed width 1 in. ft.	Depth of Water 1 in. feet.	Velocity ft. per sec.	Discharge cusecs.
1 in 5,000	2	0'75	0'343	0'615
	4	1'25	0'583	3'379
	6	2'00	0'885	12'353
1 in 2,500	2	0'75	0'484	0'870
	4	1'25	0'824	4'776
	6	2'00	1'250	17'453
1 in 1,000	2	0'75	0'766	1'376
	4	1'25	1'303	7'547
	6	2'00	1'977	27'588
1 in 500	2	0'75	1'083	1'947
	4	1'25	1'843	10'676
	6	2'00	2'796	39'018

Assuming that our critical velocity is expected to lie between 1 and $1\frac{1}{2}$ feet per second, it will be seen from the table that a furrow with a bed of four feet, a depth of water of 1'25 (1 ft. 3 ins.) and a gradient of 1 in 1,000 would give us a velocity of 1'3 ft. per second, and a discharge of 7'5 ($7\frac{1}{2}$) cusecs, and this should answer our case nicely.

We have now to set out the furrow, and while it will almost invariably repay a farmer to have professional assistance in carrying out this part of the work, a method is here described whereby a farmer can do this himself with a fair degree of accuracy. The special articles required are about 27 ft. of fine wire and a carpenter's spirit level. This spirit level should be carefully tested by reversing it on a level surface. If it shows level one way and not level when reversed, it cannot be relied upon until it is adjusted. The wire should be fastened to two short rods so that they are exactly 25 ft. apart, and the wire should pass over the top of the rods, which should be protected by a cap of tin or other

sheet metal. The wire should be marked in the middle, exactly equidistant between the rods. Suppose the back rod is 18 inches long and we wish to get a fall equivalent to 1 in 1,000. One foot in one thousand feet or one inch in one thousand inches is equivalent to '025 in 25 feet, or roughly 0'3 inches in 25 feet. The front rod should therefore be 1 foot 6 3-10th inches long. The method of carrying out the operation is to place the back rod at a point near the starting point and stretch our wire taut, and by means of a spirit level held exactly equidistant between the two rods, find a point on the ground which, when the spirit level records the dead level, will, owing to the extra length of the front rod give a fall of 3-10ths of an inch in our 25 feet length of wire. In conducting this operation the rods must be kept absolutely perpendicular. Having done this, pegs ought to be driven below both rods and the rods held on the top of them, the front one being driven in until the spirit level held on the middle of the wire records the level. This operation is continued until the irrigable land is reached. We shall now have a series of pegs 25 feet apart, following a falling contour of the ground, equivalent to a gradient of 1 in 1,000. These pegs are not likely to be in the same straight line, and as it is desirable to keep our furrow as straight as possible, in lining out many of them will fall outside the line of our furrow. This, however, does not affect the fact that if we assumed the depth below the top of the first peg to be 18 inches, the depth to the bottom of the furrow from all succeeding pegs will also be 18 inches, no matter how far away they may be from the centre line of our furrow. In straightening the line of our furrow, we shall have parts where the actual depth of ground cutting is greater than 18 inches and other parts where it is less, but *whatever* this depth may be, the bottom of the furrow will be 18 inches below the top of the nearest peg opposite. Having found the depth opposite each peg, it may be desirable to get the correct level at intermediate points between the pegs, and this can best be done by the use of "boning rods." These boning rods may be made of boards $\frac{3}{4}$ inch thick by 2 inches broad and 4 feet long, with a cross piece nailed on one end of the same material about 12 inches long. Three rods are required, and when completed they will resemble tee squares, the important point to bear in mind is that they must all be of the same length. When it is desired to get the correct

level of the furrow at any point between two pegs, this can be done by holding one of the boning rods vertically, at the correct level in the furrow opposite one peg, and another in the furrow opposite another peg. The third rod is then held in the line of the furrow between these two points, and by excavating is gradually sunk until it is seen by looking over the top of one end rod that the tops of all three are in the same straight line. If the tops of all the rods are in the same straight line, are held vertically and are of equal length, it follows that the foot of them will also be in the same straight line, and that any point in our furrow thus found will give us the correct level if the two end points are correct. With further reference to lining out the furrow, it may be accepted as an axiom that compound curves should be avoided if at all possible. In other words there should always be a length of straight between each simple curve. Furthermore, all curves should be gentle, as if too sharp there will be a tendency to erode the soil from the outer curve, and to deposit silt on the inner.

When constructing the furrow the sides should be given a slope of about $\frac{1}{2}$ to 1, i.e., for every foot in vertical height, the slope should be six inches back from the vertical. If the sides of the furrow are kept vertical, as is usually the case with farm furrows, the action of the flowing water will tend to give them this slope, with the consequence that the sides of the furrow will cave in here and there and besides choking the channel, will give it a very unsightly appearance. The cost of side sloping a shallow furrow is trifling and can easily be done, preferably by aid of a batter rule, and unless in rock or very stiff soil, will amply repay the slight extra trouble and labour. Where the furrow is in very deep cutting and the soil will stand it, the channel may be excavated with perpendicular sides until within six inches or so from the top water level, here a berm or step should be left about 18 inches wide to intercept any ground that may be washed down or fall from the sides, and from this berm to the bed of the furrow the sides of the channel should be side sloped. The cost of excavating the furrow may frequently be reduced by running a plough over the stretch to be excavated. Where there is any liability of storm water entering the furrow

below the regulator, provision ought to be made to pass this safely. Two general methods for dealing with such storm water are in use. In large canals this water is generally collected in a drain running parallel to and above the main channel and guided across the latter at intervals, over or under, in a culvert or pipe. In small furrows the custom is usually to allow the storm water to enter the furrow and to provide spillways at intervals when necessary so that any surplus, above that for which the furrow was designed, can safely escape.

The scope of such a paper as this is necessarily of a general character, but if any farmer cares to write and explain his individual case, I shall be glad to give him any assistance in my power, either in writing or by giving him a personal visit.

Common Ailments of the Horse.

BY D. R. CHATTERLEY, M.R.C.V.S.,
Government Veterinary Surgeon.

The nursing of sick animals comprises attention to every detail which conduces to the benefit of the patient. The chief things to note are :—

Ventilation in buildings, which means plenty of fresh air and no draughts.

Clothing should be sufficient for warmth and not too heavy for weak animals so as to cause sweating.

Bandages should be applied to the legs from below the knee to the camel to maintain warmth in the legs. They should not be applied too tight or the circulation will be interfered with. Woollen bandages should be used for preference, but hay or straw make very good emergency bandages. In applying a bandage do not draw any one part tighter than another. For hot bandages use flannel or blanket; for cold bandages use linen.

Food.—Sick horses which do not feed freely should be coaxed. They should be fed in small quantities and often, and as many changes as is possible offered them—especially green food which is not only appreciated by the animal, but also keeps the bowels in order. Water should always be within reach of the animal and should be changed frequently. If food is refused then the animal must be drenched with milk, eggs and milk, gruel.

Fomenting.—Let the water be hot, soak the blanket or cloth, wring nearly dry and apply to affected part, and put a thick wrapping over to keep the heat in. Change every half hour.

Poulticing.—The object of poulticing is to relieve pain, and also to soften the part to which the poultice is applied. Those made of bran or linseed meal are the best. They should always be kept moist and not allowed to dry.

COLIC.

Colic is the name applied to the symptoms which animals show when they have pain in the abdominal cavity. The pain may be due to a variety of causes, but the symptoms shown are very similar. The majority of the causes of colic are connected with the food and feeding. Crib-biting, wind-sucking, unsuitable food; sudden change of food, excess of green food, watering and working hard immediately after feeding, and also greedy feeding are the causes of abdominal pain. In the horse there are two forms of colic: spasmodic and flatulent.

Spasmodic Colic.—The pain is not continuous, but between the spasms of pain there are intervals of ease, and the animal may appear quite well until another spasm occurs. The animal is usually violent; stamps, paws, kicks at its belly, lies down, sometimes going down very gently, and at others dropping down suddenly and violently, rolls, and when down frequently turning its head to the flank, crouches when walking, stretches as if trying to stale, patchy sweating. The temperature in many cases remains normal, but the breathing is distressed, and the pulse fast. Some or all of these symptoms may be observed during a spasm, and then there will be an interval of ease, and the animal may even pick up a little food.

Flatulent Colic is due to fermentation of food in the bowels which become distended by the gases so formed. In flatulent colic the pain is *continuous*, but not so violent as in spasmodic and the animal lies down very carefully.

In both varieties there is usually severe constipation.

Treatment.—The following draught may be given to a horse showing the above symptoms:

Take of

Oil of Turpentine	...	I ounce
Bicarbonate of Soda	...	$\frac{1}{2}$ "
Chlorodyne	... ..	I "
Linseed Oil	... ..	I pint

This draught should be repeated in an hour's time if necessary. If after three hours the horse is still colicky it is advisable to give a dose of physic, that is to say five drachms of

aloes preferably in the form of a ball, and also a stimulent such as brandy or whisky 4 ounces, or the following draught:

Spirits of Nitrous Ether	...	1/2 ounce
Aromatic Spirits of Ammonia,	1	"
Cold Water	...	1/2 pint

When the animal has recovered, it is advisable not to give any food for some hours, and then a bran mash may be given. If physic has been given, the animal should be rested until purging has ceased.

In cattle the common condition which produces colic pain is "Hoven," or a flatulent condition of the rumen, caused by fermentation of the food in it. The distension is chiefly noticed in the *left flank* which is swollen and drum-like on being tapped with the fingers. The animal is uneasy, grinds its teeth and kicks at its belly.

Treatment.—If the animal is much distended it may die from Asphyxia unless the gas is removed. This may be done with a trocar and canula which should be driven into the left flank at a point about a span from the last rib, spine and pinbone and the canula should be left in until all the gas has escaped. If a trocar and canula is not at hand then the blade of a pair of scissors may be used instead and twisting the blade after penetrating to permit escape of gas. If possible these instruments should be boiled before using.

After relief has been given in this manner, a purgative should be given; either 1/2-lb. Epsom Salts or 1-1 1/2 pints linseed oil, and it is advisable to follow this with 1 ounce hyposulphite of soda twice a day in 1 pint water for 3 days.

Lymphangitis.—Weed, Monday morning disease, gout. This condition is usually met with in the hind legs, but occasionally it is seen in the fore legs. The leg suddenly swells and there may be knotted cords down the inside of the thigh, and the glands of the groin are swollen and very painful. This disease may be confounded with farcy, the cutaneous form of glanders, from which it is distinguished by its sudden appearance, generally after a rest, and the absence of ulcers on the course of the knotted cords. There is great pain and lameness.

Treatment.—Give bran mashes only for 24 hours, and then a dose of physic. Apply hot fomentations 4 times a day to the swollen limb and glands and after the acute stage has passed graduated exercise until well.

Influenza (Pink Eye).—Is a contagious fever which attacks horses and mules. Symptoms, fever and great lassitude, with generally a highly coloured membrane of the eye (pink eye), which may also be much swollen. In some cases the disease attacks the chest and air passages, in which case there will be a discharge from the eyes and nostrils, and sometimes the limbs swell considerably.

Treatment.—Isolation. In this disease there is great weakness and rapid wasting of the patient, and there is often lack of appetite. Nursing is of the greatest importance, and every endeavour should be made to get the patient to eat in order to keep up its strength. If necessary, drenches of eggs and milk should be given, and in place of giving water to drink, a bucket of milk should always be within reach of the patient. Steaming the head is beneficial, and the following draught may be given twice a day :—

Aromatic Spirits of Ammonia	1/2 ounce.
Solution of Ammonium Acetate	I „
Paregoric	... .. I „
Water	... .. I pint.

Coughs and Colds are of frequent occurrence among all animals, but most common among horses and mules. Sudden changes of temperature and exposure to draughts are frequent causes. A cold is inflammation of the lining membrane of the nostrils, and a cough is produced by inflammation of the lining membrane of the throat, and the two conditions are usually seen together. The symptoms are nasal discharge, and the cough. The discharge is at first watery, but in a few days it becomes greyish and thicker, and later yellowish. The cough varies somewhat according to the state of the throat; if the lining membrane is dry and hot, the cough will be painful and cut short, which if there is much phlegm it will be hoarse and prolonged. If the swelling of the throat is very great the animal may be unable to swallow, and the food will be returned through the nostrils. The temperature should always be taken for coughs and colds are frequently the beginning of strangles or pneumonia.

Treatment.—General attention to comfort, steam the head to promote free discharge, rub the throat with liniment. Soft food, and see that the bowels are regular by giving 2 ounces of Epsom Salts night and morning in the drinking water.

Maize Breeding and Seed Selection.

By H. GODFREY MUNDY, F.L.S.,
Government Agriculturist and Botanist.

The advantage derived from the use of selected seed is well exemplified in the catalogue of any of the well known seed merchants, wherein will be found offered for sale selected seed of almost all the more important farm crops. It is only in the case of those crops—chiefly cereals—the seed of which is home grown year by year on the farm, that selection is neglected or relegated to a very minor position. The creation of hybrids is always likely to remain the work of the plant-breeder or specialist, but improvement by selection lies within the scope of any grower who will devote a little attention to the subject, and, the labour entailed by the present method of selecting seed ears from the maize crib can with greater advantages be diverted and applied to the maintenance of a permanent breeding plot.

The object of selection is to segregate the offspring of those plants which combine the greatest number of desirable characteristics, and the aim of plant breeding by selection is to bring about the reproduction of these in such a way that they will continue to breed true to type. The advantages of the system are twofold: (a) that plants raised from selected seed breed truer to type than those raised from unselected seed and therefore produce a more uniform crop; (b) that the ideal plant, namely the one which produces the greatest yield per acre commensurate with high quality, forms the majority of the plants in the "stand." With all animal and vegetable products, wool, mohair, cotton, maize, etc., uniformity combined with high quality are essential if the best prices are to be realised.

In a previous article entitled "Standard Types of Rhodesian Maize," some description was given of the three breeds of white dent maize commonly grown in this country, together with indications of the more important points of a good ear of each. It must be remembered however, that in order to breed pure seed, the breeder must have personal

knowledge of the appearance and points of an ear of this strain. No amount of reading can impart this knowledge, and just as no one who had not personal experience of the particular animal he favours would attempt to breed prize Shorthorn cattle or Berkshire pigs, so the breeder of maize must have practical knowledge of the type of maize he is growing before he can hope to achieve success.

In the early stages of maize breeding in the United States of America—just as has been the case in Rhodesia—it was thought sufficient to pick out the largest, heaviest and best-looking ears from the maize crib. The idea being that since like produces like, this was obviously the way to increase the size of the ear and thereby the yield of grain per acre. In theory this is sound enough, but if we study the crop in the field it will be noticed that the plant producing the biggest ear may often have other undesirable characteristics which it is unwise to perpetuate, or it may have grown in a particularly favourable situation, as on an anthep, or have been influenced by other external conditions, in which case its characteristics will not be transmitted to its offspring. It is evident therefore that selection of the best ears in the crib for seed purposes in great measure fails in its object.

The obvious alternative is to select the seed in the field from plants possessing the desirable characteristics and the development of which has not been unduly influenced by their surroundings. Here again a difficulty arises, namely, that even when selected in this manner a certain proportion of the seed will fail to breed true to the parent type, and if the seed of all selected ears is mixed and sown in one plot, there is no means of knowing which plants are breeding to type and which are failing to do so. In order to overcome this, and to enable the breeder to eliminate those plants—which fail in this respect, the “ear to row” method of planting was introduced.

During recent years there has been much controversy amongst American authorities on the subject of broad and narrow breeding of maize—it being held by some that the system of selection in a relatively small breeding plot is too conducive to inbreeding, and will in a short time lead to deterioration of the strain. It has even been suggested that

since the maize plant is by nature adapted to cross pollination, nature should be further assisted by planting seed of mixed origin. On the other hand, many breeders have produced prolific strains of maize originated from one single ear or parent plant, thereby following the principles of excessively narrow breeding.

It has repeatedly been shown that, when maize is entirely self fertilised for a number of years, deterioration which may even result in sterility occurs, but on the other hand, through the reproductive organs of the plant are constituted by nature to provide for cross fertilisation, there is little doubt that a certain amount of self fertilisation usually takes place, and this apparently without harmful effects. The "ear to row" method of breeding follows a middle course, and until stronger arguments can be brought against it, appears the most satisfactory means of improving the quality of our seed, while at the same time retaining uniformity by permitting of cross fertilisation between nearly related individuals. This is precisely the same process which is followed in the line-breeding of cattle.

THE BASIS OF SELECTION.

Having decided that the "ear to row" method is the one most likely to meet our requirements, we must next consider the points of the ideal maize plant which it is desirable to perpetuate. The date at which these notes appear will shortly be followed by the time when selection in the field should commence, and in addition to a consideration of the best type of ear, the selection in the first instance should be largely governed by the appearance and quality of the parent plant. It must be remembered that as the plant is, so to a great extent will be the ear, and, as in the case of animals, if we desire to produce large healthy offspring, we choose as parents well developed sire and dam, so with vegetables correspondingly desirable qualities should be present in the parent plant.

The vegetative characters of the desirable maize plant should be somewhat as follows :—The stalk should be

strong and robust, thick at the base and tapering gradually. It should carry a well developed system of primary and secondary roots (adventitious rootlets from the lower node of the stem), and needless to say should produce at least one large, well-filled cob. Many plants, particularly on rich soil, show a tendency to produce suckers, which is an undesirable feature in that this secondary growth seldom bears a cob, or should it do so, the grain is of an inferior quality. The removal of suckers entails much hand labour while if they are left and fail to set seed, the vigour of the plant, which should go to developing the main cob or cobs, is expended in useless vegetative growth. Absence of suckers is therefore a desirable point. The ear should be produced about four feet from the ground or rather below the middle point of the stem. The object of this is that a uniform height of cobbing facilitates harvesting and militates against the danger of the plant becoming top-heavy. It would appear that the two last points are influenced to a greater or less degree by the fertility of the soil, but they are also to some extent hereditary characteristics. The leaves are the food factories of the plant, and a good leaf growth is therefore essential. Individual plants vary greatly in this respect, and it is usually noticeable that the stem with the best leaf growth also carries the largest cobs. The leaves should be healthy in colour, broad and well developed. The shank or stalk of the ear should be short and strong and should not as a rule exceed three to five inches in length. The mature ear should be well covered by the sheath or husks. If the sheath is short and leaves the tip of the ear exposed, the grain, when in the milky state, is liable to be injured by insects or to become mouldy and rotten from late rains falling upon it. The question of how many ears a plant should produce is more difficult to settle. In the writer's opinion one good ear per plant is preferable to two moderate or inferior ears, while three or more ears are undesirable. This is a point which breeders must decide for themselves, and in which personal experience will prove the surest guide.

The question of disease resistance must also be considered, and where maize blight or other diseases are prevalent, immunity will constitute an important factor in selection.

POINTS OF THE EAR.

To those who are familiar with it, each type of maize possesses certain well marked characteristics, but there are also several points which apply equally to any good ear of whatever breed. The following are among the most important:—The ear should be as cylindrical as possible in conformation with type characteristics. Certain breeds naturally produce tapering ears, but the cylindrical ear with well rounded butt and tip usually yields more grain of a uniform character. The butt should be well and evenly filled in such a way that it protudes slightly over the base of the shank. The tip should be well covered with plump grain of uniform type. A moderate sized ear free from defects is preferable to a very large and faulty ear. The kernels should be uniform in size and shape and of good colour, closely packed together and firm on the cob. The rows should be straight, free from twists and breaks, and with as little space between as conforms with the breed type. Too much importance should not be placed on the small size of the core; certain breeds, as for instance Hickory King possess this character to a marked degree, but increase in number of rows is usually followed by a corresponding increase in size of core, and the core of a ten row Hickory King ear is generally slightly larger than that of an eight row ear of the same breed.

The description of the points of a well developed plant and of a good ear has occupied some space, but with a little experience a breeder can take in at a glance the characters he is looking for, and in practice the eye passes over inferior plants or ears and is not arrested until the desirable individual is encountered.

SELECTION IN THE FIELD.

Selection in the field should commence as soon as the cobs are well formed, and before the leaf growth has commenced to deteriorate. As the desirable plants are located they may be marked off by knotting a small piece of coloured limbo around the stem just above the cob. About 25 per cent. more than will be actually required should be marked in this way, since some proportion is likely to prove undesirable as development proceeds. The marked plants are now left until the whole crop is ripe and are then harvested separately—*the whole stalk being cut with the ear attached.* These stalks

should be carried to the homestead and stored in a safe place until time permits of further handling. Since the breeding plot should contain from fifty to seventy-five "ear to row" plantings, at least 125 to 175 plants should be marked down in the initial selection, and in order to facilitate harvesting, the first selection should be made from a comparatively small field, one of five to ten acres in extent will usually supply the requisite parent plants.

FURTHER SELECTION.

The selected ears should be removed from the stalk and husked by hand, and a certain proportion which at first glance do not conform to the standard can be discarded. This will probably leave from 100 to 150 ears from which to make the final selection. These should be laid out in one or two rows and the necessary number of ears to form the breeding plot can then be selected. The writer has found the following a very simple method. A hundred or more cheap paper bags are provided and the fifty or seventy-five ears finally selected are placed in a row in descending order, that is, the ear most nearly approaching the ideal is placed first and the poorest last. Each ear is then slipped into a bag and the number of its place in the rank is recorded on the outside. The best ear will thus be No. 1, and the poorest No. 50 or 75 as the case may be. The bags containing the ears can now be put on one side, for preference in a tin-lined airtight case, and if necessary can be fumigated with carbon bisulphide.

As time permits the ears can be taken out, measured, weighed, and the percentage of grain to total weight of ear recorded. This is obtained by deducting the weight of shelled grain from the total weight of the ear unshelled. Any notes regarding the relative qualities of the ear or grain can also be recorded in a note book, and after the inferior kernels at the butt and tip have been removed, the selected seed is put back into the bag and reserved for planting time. The character of the notes made will differ with the taste of the breeder, but such points as weight, length and circumference of ears, size and depth of grain, number of rows, space between rows and quality of butt and tip should be recorded, though not absolutely essential to the success of the breeding plot. The careful breeder will also have noted the vegeta-

tive characteristics of the parent plant—such as height of plant, quality of leaf growth, number and size of ears, date of the appearance of tassel and silk respectively, and so on.

THE BREEDING PLOT.

The pollen of the maize plant is exceedingly light, and in a dry atmosphere may be carried considerable distances by wind. The breeding plot should be at least 400 yards from any other maize, and in order to guard against the danger of volunteers, should be if possible on land which has not carried maize the previous season. The soil should be of similar character to that on which the bulk of the crop will be grown, and should receive no special treatment except such as is meted out to the main crop. The rows in the plot should be of equal length, and may be regulated by the amount of seed available from the several ears. A small proportion of seed from each ear should be reserved for filling in blanks and for reference with the grain of its progeny when the latter is reaped. Seed should be dropped singly and planting by hand or with a hand dibbler is the most satisfactory method. The grain from each ear is planted in a separate row and the rows are numbered accordingly. It is advisable to commence planting the centre of the plot with Nos. 1 and 2; Nos. 3 and 4 coming to right and left respectively and so forth. By this means the seed of the best ears is in the middle of the plot, and these plants are less liable to fertilisation by stray pollen from unselected seed, or to injury by cattle or vermin. The breeding plot may be situated in the main crop planting of the same variety, or better still, in the midst of the "increase field," but where possible its entire segregation is preferable.

DETASSELLING.

In order to guard against self fertilisation, and the possible deterioration which may thereby occur, alternate halves of each row are detasselled, that is, the male flower or tassel at the top of the stalk is removed as soon as it appears. Detasselled plants will thus be fertilised by "entire" congeners in the adjacent rows, and *seed will only be saved from detasselled plants*. With this exception selection in the breeding plot is proceeded with in exactly the same manner as in the preceeding season, and the process, one of continual improvement is carried on year by year.

To be effective selection in the breeding plot must be rigorous, and during the early stages of growth any plants shewing undesirable traits should be cut out entirely. Certain rows will also fail to breed true to type and these also should be cut out as early as possible and if practicable before the male plant has shed pollen.

In the ordinary course of events several ears will probably be selected from each of a certain number of rows, and the second generation can be numbered 1a, 1b, 1c, 5a, 5b, 5c, and so forth as applies to each. In this way the pedigree of each ear is known, and the remarks pertaining to it can be traced in the stud book.

The remainder of the seed secured from the breeding plot should be superior to that from the main crop of the farm, and if of sufficient quantity, can be used for main crop sowings the following season. Failing this, and in particular in the case of the breeder of pedigree seed, it can be sown in a larger plot, often known as the "increase field," from which the entire seed for the third season's sowing can be obtained.

The number of enquiries, as to where pure seed maize can be obtained, which reach this office indicate very clearly the need which is felt for better seed, and there is no doubt that the farmer who will give sufficient attention to his breeding plot will be amply repaid by the prices which can be obtained for selected seed. Maize growers in Rhodesia realise the need for good seed, and are prepared to pay a reasonable price in order to secure it, but the present system of selecting seed ears indiscriminately from the crib entails a good deal of time and labour without achieving its object. For the large grower who does not consider he has time for the niceties of records, the breeding plot together with the increase field as outlined above afford good possibilities of increasing his profits, and careful annual selection of seed by this means spells certain improvement in yield and quality.

Finally a word of caution to those growers who, on limited areas and in too close proximity are attempting to grow two or more kinds of maize. The effects of cross fertilisation may not be apparent in the first generation, but in time it will leave its mark, and in the second or third generation

lack of uniformity coupled with deterioration and a splitting up into innumerable types and sub-types will surely make its appearance. There is so much maize of inferior quality being produced that manufacturers are in a position to pick and choose, and it is only the best grades which will command top prices. It remains for the grower to decide whether he will compete for these prices on the European market and at the same time increase his acre yield, or whether he will be content to accept a smaller price for a medium quality article suitable either for conversion into mealie meal or for home feeding to farm stock.

SPECIMEN PAGES FROM THE MAIZE RECORD BOOK.

SALISBURY WHITE.

1st Year.—Plant No. 1. Height 10 ft: Ears produced about $4\frac{1}{2}$ feet from ground. Free from suckers. Ears, one large and well-filled, one rudimentary. Leaves twelve in number long and broad. Tassel appeared Feb. 28th. Silks (female flower) produced March 1st. Ear from plant No. 1. Length 9 ins.; circumference 7 ins. Percentage of grain to ear 89. *Ear rather too tapering, but butts and tips well filled. Kernels broad and tapering gradually. Length of kernel..... breadth..... Rows straight, but space between rather too wide, about $\frac{1}{6}$ th inch.

*Note.—In the second year's selection only those plants producing ears showing these faults to a lesser degree would be selected, and thus in time the failing would be bred out.

2nd Year.—Plant No. 1d. (One of the plants raised from seed of Plant No. 1.). Height $10\frac{1}{2}$ ft. Ear produced about $4\frac{1}{2}$ feet from ground. No suckers. Only one ear. Leaf growth good. Tasselled March 3rd, Silk appearance March 7th. (Season later for all maize).

Ear No. 1d. Length $9\frac{1}{2}$ ins.; circumference 7 ins. Percentage of grain to 90. Ear moderately cylindrical. Butt and tip good. Kernels as those of parent. Space between rows about $\frac{1}{8}$ th inch.

Selection of a Spraying Outfit.

By RUPERT W. JACK, F.E.S., Government Entomologist.

The variety of spray pumps stocked by Rhodesian firms at the present time is very small indeed, indicating that the demand for such articles is limited to the simpler and cheaper forms. The number of orchards is, however, growing year by year, and farmers in general are inclined to pay more attention than formerly to this branch of their industry, and to realise that care of their industry, and to realise that care of their orchards is necessary to produce commercial success. It is likely, therefore, that a few notes on the selection of a spraying outfit will be of value to some of our readers.

The simplest form of machine for applying insecticides to plants is the garden syringe. In gardens and greenhouses the syringe is of value and is commonly used successfully to clean roses of aphides and similar purposes. Its drawbacks are, however, many and render its use for applying insecticides to orchard trees, with one exception, out of the question. The exception is the application of poisoned bait to the trees for the destruction of Fruit Fly, according to the Mally process. This bait needs only to be squirted in small quantities over each tree, and the syringe answers excellently for this purpose. Its drawbacks for delivering large quantities of insecticides lie in the labour involved, the coarse and intermittent nature of the spray and the low pressure under which it is delivered.

The instruments known as "Atomizers" deliver a much finer spray than a syringe and thus have an advantage over the latter in applying arsenical solutions. The heavy labour, intermittent spray and low pressure remain as drawbacks however, and they are not to be considered for use on any considerable scale. A rough figure of one of these machines is given at Fig 1. Messrs. George Findlay & Co., Cape Town, used to stock "Atomizers" and probably do so still.

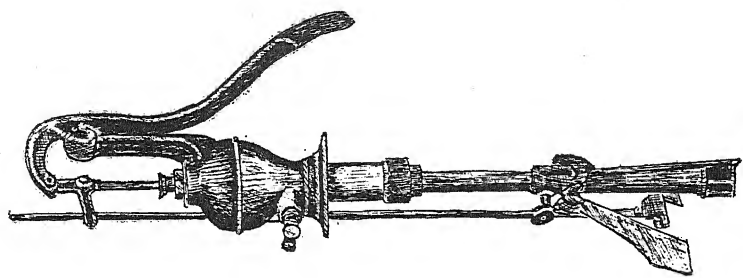
For the orchard therefore a spray pump delivering a continuous fine spray under high pressure is necessary,

One of the simplest forms of an effective spray pump is shewn in Fig. 2. This is the "Success" bucket pump, manufactured by Deming Co., U.S.A. In use the insecticide is contained in a bucket or paraffin tin and the base of the pump is inserted, the foot rest being outside. The pump is held in position by the foot and worked by the handle above. The swelling at the top of the cylinder is the air chamber, without which a spray pump cannot maintain an even pressure and therefore an even discharge. The pump may be fitted with twenty or thirty feet of hose and provided with an extension rod and still deliver as good a spray as when the short length is used. The bucket pump is described as a one man outfit, but with a longer hose better results will be obtained with two men, one to work the pump and the other to give all his attention to distributing the spray evenly and thoroughly. These pumps in several patterns are stocked by most of the hardware firms and general dealers in our territory at about 30/- each.

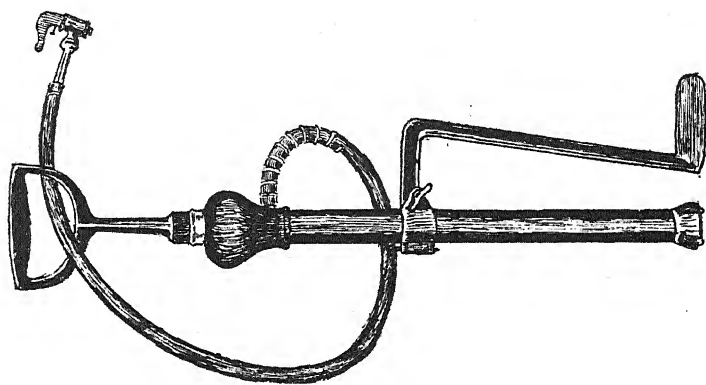
The drawbacks of the bucket pump lie in the small amount of liquid contained in the vessel, involving much expenditure of labour in spraying many trees, the small capacity for delivery, the absence of a mechanical agitator and the trouble of constantly shifting the outfit. The latter two drawbacks are avoided in the Knapsack pattern of spray pump, one of which is shown in Fig. B. This pump can be obtained from Messrs. Jas. Robertson & Co., Cape Town, f.o.r. 50s. These pumps, however, have but a low pressure. There are a variety of knapsack pumps on the market and many of them are excellent in their way. There are certain points which should be considered when purchasing one of these machines. In most makes the vessels are of copper, in order that they may withstand the chemical action of the copper salts contained in Bordeaux mixture and other preparations of copper compounds. Copper is attacked by the Lime Sulphur wash, but in Rhodesia the knapsack pump is not likely to be needed for this preparation, which is a winter application to deciduous trees for the destruction of scale insects. Galvanised iron tanks should be avoided if the pump is to be used for Bordeaux Mixture. The working parts of the pump itself should be of brass and should have no rubber parts, as this material perishes under the influence of paraffin washes. In some makes the lever acts at the lower corner of the tank so that the arm of the operator is lower,

and thus the work is less fatiguing than when the lever works over the shoulder. These pumps have but few exposed parts and are in general excellent machines. Knapsack pumps are suitable for spraying very small trees, but their chief use lies in the direction of potatoes and other crops, killing vermin in fowl houses, etc. Knapsack pumps of various makes can be obtained from hardware and general merchants in Rhodesia for 50s. to 70s.

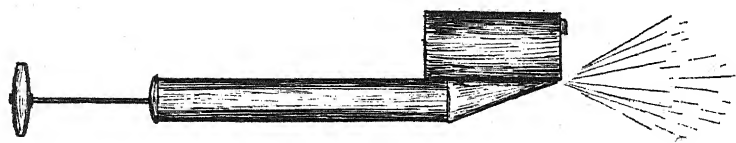
We now come to the class of machines known as barrel sprayers. As their name suggests they are made for attachment to barrels which contain the liquid spray. The barrels in the smaller varieties are furnished with side poles and handles to lift them from place to place, or, as with the larger sorts, are mounted on wheels. Frequently the larger barrels are drawn by horses or mules or are mounted in Scotch carts. Fig 4 represents a small barrel pump. It is made to mount through the end of the barrel and is provided, as in the illustration, with an air-chamber attached to the cylinder and a mechanical agitator. The Y connection is attached to take two lines of hose. This pump is stocked by Messrs. George Findlay & Co., Cape Town, and costs 50s. without the barrel, f.o.r. at Cape Town. A very excellent and powerful pump is shewn in Fig. 5. In this make the pump cylinder is, as may be seen, totally submerged in the liquid, the taller cylinder on its left constituting the air-chamber and containing the discharge tube, the discharge being delivered at the T shaped pipe above, which is usually fitted with a lead of hose on either side, though by screwing a cap on one end a single lead may be used. There is very little to break about this pattern of pump, and it is largely used in commercial orchards at the Cape. With a $2\frac{3}{4}$ inch cylinder the price is £6 6s. without the barrel f.o.r. Cape Town, and the pump is stocked by Messrs. Jas. Robertson & Co. This pump will serve up to eight nozzles at the same time. A smaller size of similar pattern with a $2\frac{1}{2}$ inch cylinder is stocked by the same firm at £4 4s. The Deming Company makes a pump working on the same plan which goes under the name of the "Century" barrel sprayer. The cylinder is $2\frac{1}{2}$ inch in diameter. The pump is stocked by Messrs. George Findlay & Co., Cape Town, and the price f.o.r. Cape Town, is 60/-. The points to be observed in regard to barrel pumps are that the working



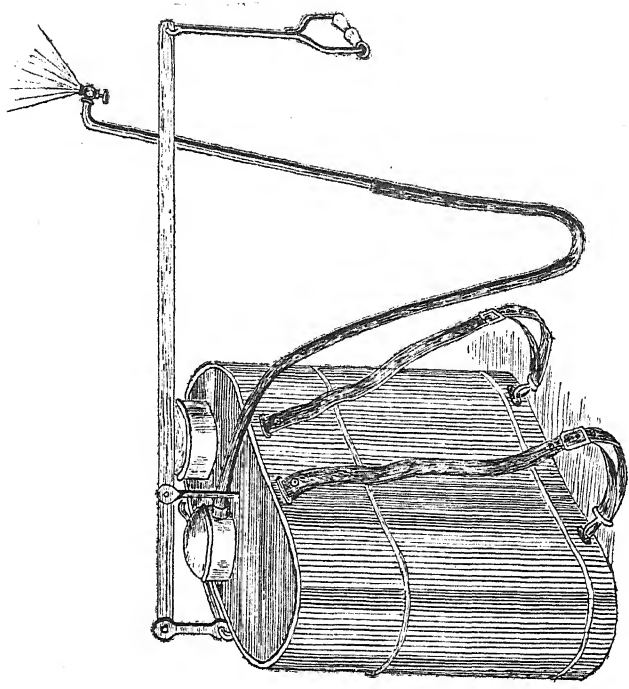
Simplex Small Barrel Pump.



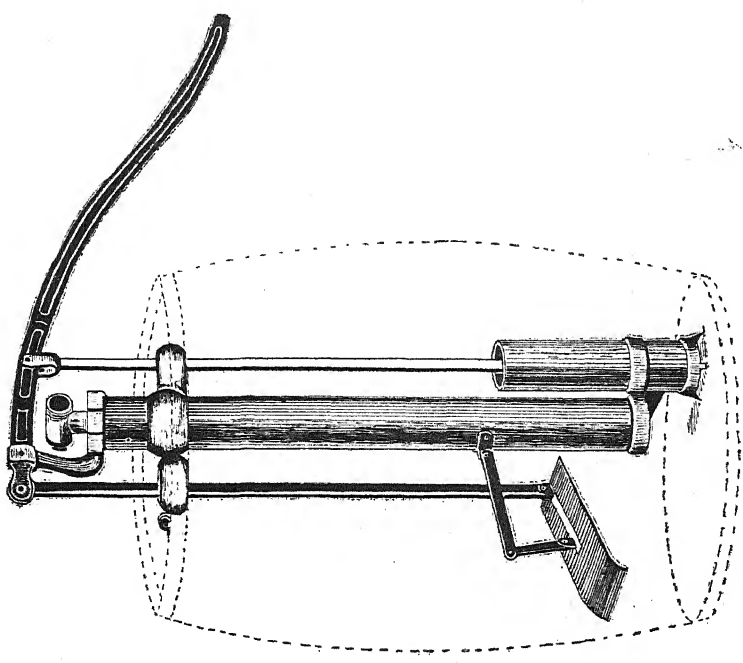
Success Bucket Pump.



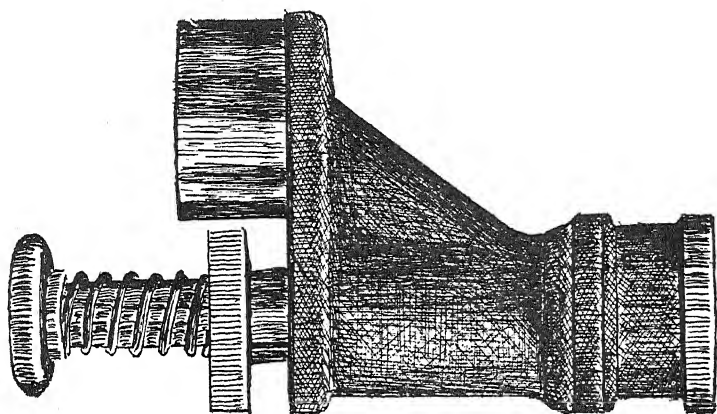
Atomiser.



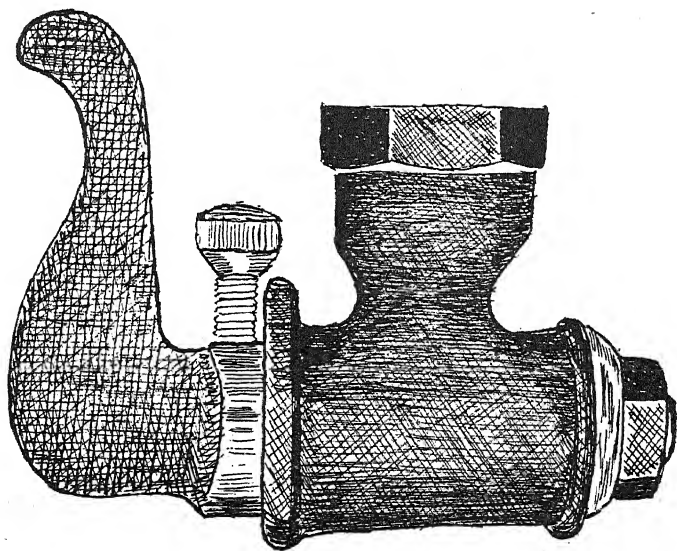
Eclipse Knapsack Pump.



Eclipse Barrel Pump.



Bordeaux fan-shaped Nozzle.



Cone-shaped Nozzle.

parts are of brass, that there are no weak cast-iron parts to get broken, that the construction is as simple as possible, that broken parts can be easily replaced, that there is not too much weight above the barrel and that the attachment to the barrel is as firm as possible. Thin-necked air-chambers of cast iron projecting above the pump are rather liable to be broken, and in the writer's opinion constitute a weak point in the pump.

There is another class of spray pump on the market which has not, however, come into extensive use in South Africa for orchard spraying. As is well known, paraffin oil, or kerosene as it is termed in America, is a very powerful insecticide. In its pure state it is very injurious to vegetation also, and unfortunately does not mix naturally with water. A class of spraying machine termed "Kerosene Sprayers" has therefore been evolved. These machines mix the oil and water mechanically in the act of spraying, and so deliver a diluted paraffin oil spray to the trees, or to the cattle, as this mixture is an effective destroyer of ticks and is used by some farmers for this purpose. Kerosene sprayers are manufactured in the form of bucket, knapsack and barrel pumps. The oil is contained in a separate vessel attached to the pump which is furnished with an indicator by setting which a certain percentage of paraffin is supposed to be mixed with the water. The writer's experience of these pumps is, however, to the effect that they need a very careful and experienced operator to maintain a delivery of anything like a constant percentage of oil. A pump delivering too large a percentage of oil is capable of doing considerable amount of damage in a very short space of time, whilst too small a percentage renders the spray ineffective as an insecticide. For this reason these pumps cannot be considered as altogether a success.

A pump depends largely for the success which may attend its use on the nozzle through which the spray is finally delivered. There are two classes of nozzles in general use, termed respectively Fan-shaped and Cone-shaped, the name not applying to the shape of the nozzle itself but to that of the spray that issues from it. The best known of the fan-shaped nozzles is shewn at Fig. 6. This is the "Bordeaux." This pattern of nozzle can be adjusted by turning the lever

to throw either a solid stream or a mist-like spray adapted both for long and short distances, and is generally considered to be the best all-round pattern on the market. It is the one used for distributing locust poison in South Africa. In spraying fruit trees for the destruction of scale the forceful fine spray which it delivers is excellent. The nozzle can easily be cleared of obstruction by opening it fully for a moment whilst the pump is working. There are other makes of this pattern than the "Bordeaux," some more or less close imitations, and others containing small modifications. Messrs. Jas. Robertson & Co., Cape Town, stock a British-made nozzle similar to the "Bordeaux" and apparently throwing a similar spray, though the nozzle itself is not so neatly finished off and sells at a cheaper price. The Bean Spray Pump Company, California, have also some good fan-shaped nozzles on the market, some of which are stocked by the above Cape Town firm. Fig. 7 represents the well known Vermorel pattern of cone-shaped nozzle of which several modifications are now on the market. These nozzles are provided with two caps with different sized holes for throwing finer or coarser sprays. The finer sprays are used for distributing poisons over trees, and the coarser for contact insecticide which need to strike the tree with greater force. These nozzles are often mounted double, or triple, in order to cover a greater space at a time. In these forms they are largely used in the Cape Colony, and elsewhere, for spraying against Codling Moth. The very fine mist-like spray is especially suitable for covering foliage finely and evenly. The nozzles are cleared if they become obstructed by pressing the little plunging rod from behind, thus thrusting a fine lance through the aperture.

For orchard work, barrel pumps are usually fitted with two 25 to 30 feet leads of hose, so that when the outfit is taken between the orchard rows the trees on either side can be sprayed at the same time. In this way three men are required to carry out the work, one to pump and one at each hose to spray. The hose used in connection with most spray pumps is three-eighths or half inch internal diameter. Blue rubber hose is preferable to red, and should be obtained when possible.

In order to reach the top of fair-sized trees it is necessary to have some sort of extension rod to enable the operator to

lift the nozzle sufficiently. Some use an ordinary light bamboo rod fitted at the end with a clamp to grip the end of the hose, but this form is rather clumsy to use. The majority use a special eight foot brass-lined bamboo extension rod which is a continuation of the hose and is easily handled. These are usually provided as part of the outfit with the better barrel pumps, and are useful in connection with bucket and knapsack pumps when these are used for spraying trees. An extension rod is commonly fitted with a curved short tube at the end to take the nozzles, so that the spray issues at an angle to the line of the rod and is thus more conveniently brought into contact with the foliage and is better adapted for spraying inside and underneath.

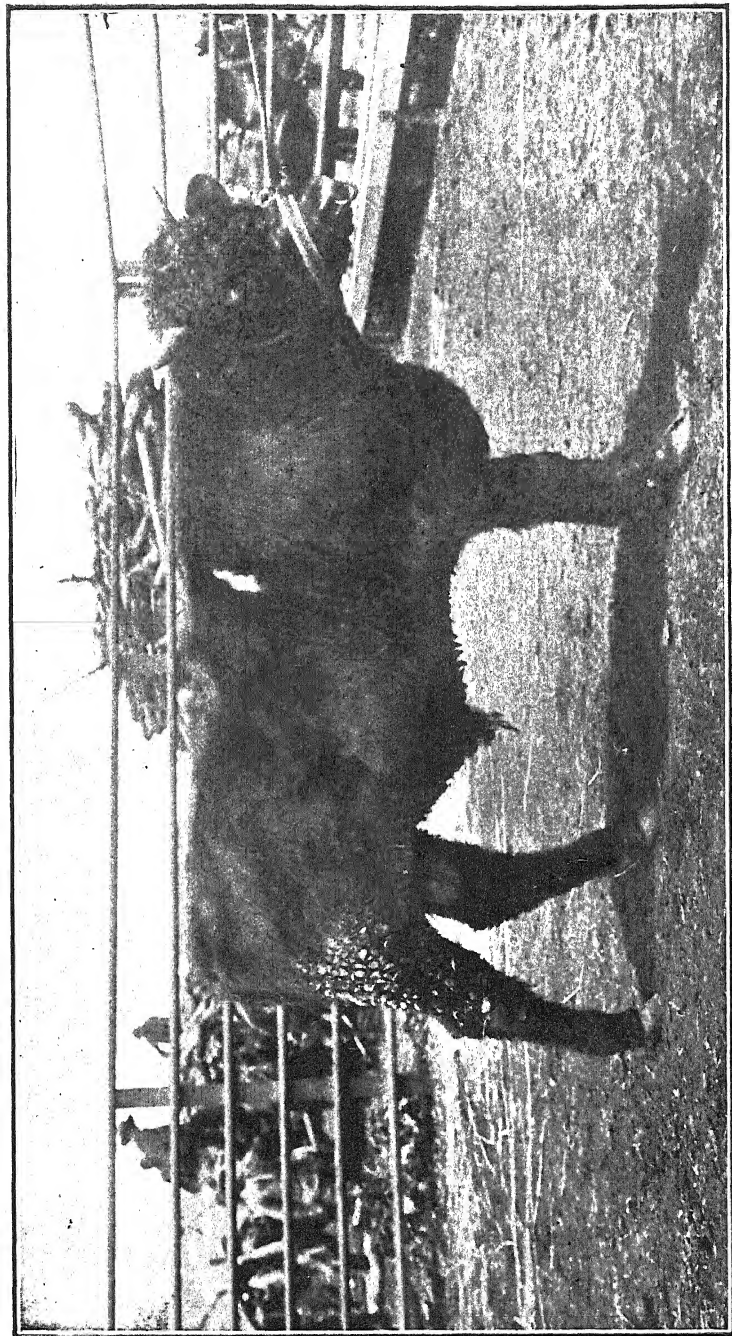
A spray pump requires the care that is demanded by all machinery if it is to be preserved in good working order. No preparation should be allowed to remain in it longer than is necessary for the spraying operations, the first care when these are finished being to pump through a quantity of clean water in order to clean all the parts. In the case of pumps of the knapsack pattern, the pump after cleaning should be placed in a position to drain and dry the tank as quickly as possible. A mixture of soap and water may well be pumped through to remove the oil if the pump has been used for paraffin preparations, as this chemical attacks the rubber and has a tendency to cause the tubes to perish. The parts exposed to friction should be oiled at intervals. A new coat of paint will prove a good investment when the old one is beginning to wear through. The barrels of barrel pumps are frequently kept filled with water in order to prevent their developing leaks, and this is a good precaution. It is, however, as well to remove the pump if they are to be kept in this way for any length of time, as prolonged immersion partly in and partly out of the water will not improve the pump cylinder and other parts.

If any reader of the *Agricultural Journal* wishes to purchase a spraying outfit and is uncertain which pattern will suit his purpose best or where to obtain it, the writer will be pleased to furnish advice. To enable him to do so particulars should be furnished of the extent of orchard or land which he wishes to spray, and the nature of the pest he wishes to combat.

The Lincolnshire Red Shorthorn Breed of Cattle.

By G. E. COLLINS.

Before the year 1895, the Lincoln Reds, as the Lincolnshire Red Shorthorns are popularly called, were little known beyond their native boundaries, although Lincolnshire had long ago earned the proud title of premier agricultural county in England. It was in that year that the Lincolnshire Red Shorthorn Association was formed to promote the interests of this variety of the great shorthorn race, by publishing a register, and securing uniformity of type and colour. There were (in 1909), 320 members of the Association, and 741 bulls and 663 cows and heifers were entered in the 15th Volume of the Herd Book; the number of bulls entered now being 6,526. But it was not till the year 1901, when the Royal Agricultural Society of England first granted them special breed classes at their Exhibition at Cardiff, that the cattle really began to attract attention, and the comments of the ring side, both from foreign buyers and home breeders were distinctly favourable; the general opinion was that they were bred on shorthorn lines to a well-defined type and colour, showed great and evenness of flesh, and were possessed of undeniable milking qualities. Since then there has been a steady advance both in the appearance and the popularity of the cattle. There has been no "booming," no sensational prices, and no flourish of trumpets; but the cattle have been making their worth known by the best of all possible tests—practical experience. For many years their admirers had claimed the Lincoln Reds to be the ideal tenant farmers' cattle, hardy and thrifty, and with the soundest of constitutions; that they were economical feeders, and animals that came quickly to maturity; a race of beef and milk producers;



*Lincoln Red Shorthorn Bull, the property of Mr. G. Fitzgibbon, Mount Shannon, Rhodesia.
Photographed on his arrival in January, 1911.*

and, in fact, real rent payers. But of late years the lessons of the show ring have resulted in greater shorthorn neatness, better backs and shorter legs; and this without losing the qualities that make them so valuable, not only to the men of Lincolnshire, but to a rapidly increasing number of tenant farmers in all parts of England, in the dairy countries of Europe, and in South America, Australasia and South Africa. It is claimed by the admirers of the breed that the cattle are the ideal tenant farmers' cattle, and their history shows that the boast is no idle one. Wintered in fold yards, with little or no shelter; fed on barley straw and a few turnips; exposed to the coldest of winds and the wettest of weather, the weakest have been weeded out with most marvellous certainty. About the middle of April they are turned out to get their own living, facing the biting east winds from the North Sea, and if there is any delicacy in cow or calf it is soon discovered. During the hot months of summer there is often little drink but such as is provided by stagnant ponds. This is the test that has been going on in the case of the Lincoln Reds for a hundred years or more. And the result? distinctly a case of the survival of the fittest; a race of cattle that not only do not lose their condition under circumstances that would have had the most disastrous results as regards most breeds, but thrive and grow on and improve, laying on a wealth of lean flesh and providing a bountiful supply of rich milk for the nourishing of their offspring. This is a state of things that tenant farmers all over England and in the Colonies should take notice of, this ability to grow and develop where most breeds would pine and shrink, and to bring up two or more calves besides their own. At two-and-a-half years old the grass-fed steers may be looked upon to yield from 8 to 10 cwt. of the best meat, and stall fed cattle up to 24 cwt.; and the butchers say they cut up a far greater proportion of lean flesh, with very much less offal, than any other breed they know. By judicious selection and proper treatment the milking capabilities of the breed may easily be developed, as has been proved by Mr. John Evens's wonderful successes in the chief milking trials in England and Ireland, where he has demonstrated the superiority of the Lincoln Reds over all other breeds. The reputation of the breed as an ideal dual-purpose cattle is thus fully established; for no other breed can boast such

beef-producing steers, and at the same time such milk-producing females. From the above description we see that their chief characteristics are:—

1.—Hardiness — because they are naturally reared by tenant farmers who make them “rough it” in a changeable climate, and they are not in-bred.

2.—Whole red colour.

3.—Early maturity, producing young bullocks of first class quality.

4.—When bred for milk they have proved that they can hold their own for quantity and quality in any company.

So much for the Lincoln Red Shorthorns at Home, but the vital question is are they suitable for South Africa? Let us see.

Five years ago, Mr. Price, of Thornhill, Queenstown, C.C., brought out a yearling bull, “Burton Pedro,” and two heifers. To-day, these three animals are running about in the veld with other cattle. They have held their own in condition. “Pedro” has won one Championship and three first prizes in his new home. His stock from native cows show a tendency to grow and mature more quickly, at the same time retaining their constitution and hardiness. Mr. Price is so satisfied that he has just imported another bull of the same breed. The cows have won several prizes, and have bred and milked well.

Perhaps no one in Cape Colony has gone into Lincoln Reds so thoroughly as Mr. L. E. Edwards, of Schoombie, and with marked success as the following record will prove.

At the Port Elizabeth Show this year:—

Shorthorn Bull, open, imported or otherwise, Lincoln Red, 1st.

South African bred Shorthorn Bull, under 2 years, Lincoln Red, 1st.

Shorthorn Cow, imported or otherwise, Lincoln Red, 1st and 3rd.

South African bred Shorthorn Cow, Lincoln Red, 1st.

Heifer, 3 years old, Lincoln Red, 1st.

Heifer, under 2 years, Lincoln Red, 1st.

Champion Shorthorn Bull, "Stenigot Duchess Beau," a Lincoln Red. This bull has never been beaten in the Colony yet.

Champion Shorthorn Cow, "Burton Short Tail.

At Middleburg Show, and also at Aliwal North, Mr. Edwards was equally successful.

Through the winter, Mr. Edwards had about 50 cattle—Pure Lincoln Reds and Lincoln Red grades, running out in the veldt, having no artificial food. These were seen in August. They looked thrifty and doing well. They included three Lincoln Red Cows purchased through Mr. Frame seven years ago, and several young cattle sired by the bull "Burton Hebrew." Here again the progeny of the Lincoln Red bulls on the hardy native cattle was eminently satisfactory. There was also a small herd of the pure-bred Lincoln Reds, including the above show winners, running on the veld, having artificial food once a day and keeping themselves in real good condition.

To Natal Messrs. Evans & Anderson have taken several Lincoln Reds out with success, and the young bulls by these imported sires are keenly sought after. At the celebrated Nel's Rust Dairy, Mr. Baines has two which he is using with good results.

In the Transvaal, Sir George Farrar, of Bedford Farm, has been breeding up for some years and has established a choice herd, where they are doing well.

In Rhodesia the largest number seen were on Mr. Hull's farm in the Matopos. Here are two four-year-old red bulls from Steingot, kept up in the day time, running out with the cows at night. The calves by these sires from little cross-bred cows of all sorts and descriptions are a revelation. In another paddock were a batch about a year old—50 in number. 48 of these were by the Lincoln Red bulls and 2 by a native bull. Here was a good object lesson of the value of using improved sires, worth anyone's while to see. There were also older animals with two crosses of the Lincoln Red blood. Of course the improvement in second cross is

not so pronounced as the first, but the pedigree influence of the Lincoln Red comes out strongly. They seem to have the power of impressing their stock with their own colour, improved shape and growth. The difference between these cattle and the native cattle of the same age, must in the writer's opinion make a vast difference in the balance sheet. Doubtless Mr Hull would be pleased to show intending purchasers these cattle. They are worth a visit, and will prove that fact is stronger than fiction.

On Col. Grey's farm at Borrowdale, an 11 year old Lincoln Red sire did good service for a while, and bulls of the Shorthorn cross were making a marked improvement.

Two years ago, Mr. Fitzgibbon, of Mount Shannon, brought out two Lincoln bulls, "Harpswell Surprise," and "Burton Wisp." These he is mating with big, first-class Afrikaner cows. At present there are only about 20 calves, level and of good colour. The experiment looks like being a great success, and these bull calves, acclimatised as they will be, must be a very valuable asset to mate with the native cattle. The owner is so satisfied that he has just got out another young bull, "Burton Exile," a son of the noted champion bull "Scampton Exile." (*See illustration taken on arrival.*)

The above details seem to prove that these cattle can, with reasonable care, live and thrive in South Africa.

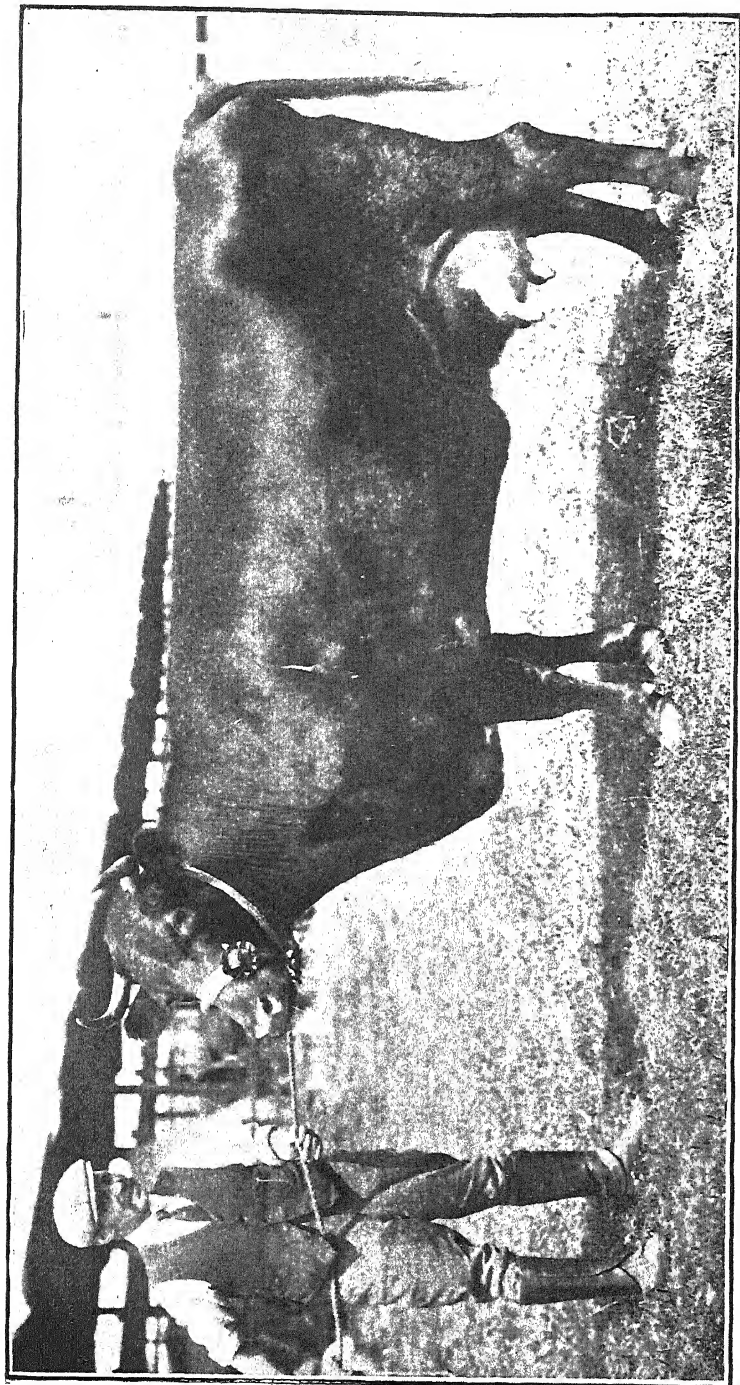
On one side of the county at home, little notice is taken of milk producing. The animals are thick, square, short-legged hardy animals, well suited for beef and ranching purposes.

It is Mr. Evens who has demonstrated to the world by means of his wonderful successes in milking trials and butter tests in England and Ireland the great dairy properties the Lincoln Reds are capable of when they are specially bred for it. Animals from this herd have won all the principal trials in England, including 2 challenges cups, 4 champion cups, 24 medals, 61 prizes at the London Dairy Show.

Bath and West of England : 1st milking, three years in succession ; 1st in three days butter test.

Dublin : 1st and challenge cup four years in succession.

Belfast : 1st and challenge cup three years in succession.



*Lincoln Red Shorthorn Cow, "Burton Quality III." Champion Female and Winner of many prizes in England.
[Photo by F. Babbage, London.*



Lincoln Red Shorthorn Heifer, "Burton Rose XI." Winner of Two First Prizes, London Dairy Show, 1910.
[Photo by F. Babbage, London.]



Lincoln Red Shorthorn Bull, "Burton Hermit II," a leading winner sold to Chile.

{Photo by F. Babbage, London.



Tring: The largest trials in England, 4 firsts and 3 seconds in last eight years. Here "Burton Margaret" holds the record for producing the greatest quantity of milk and butter in a day.

At the Royal Show of England this year "Burton Fuchsia III" gave in 24 hours 77 lb. 12 oz. milk, containing 45% fat which churned into 3 lb. 12½ oz. butter. This constitutes a "record" for any pure bred cow in England.

There are to-day in the Burton herd 40 cows and heifers which have won in public show yards and milking trials.

Probably no herd has produced such successful sires in recent years as has the Scampton herd belonging to Mr. G. E. Sanders, much of the success of this herd being due to "Keddington Ruby" (1243), whose sons have made more money at the association's sales at Lincoln than have those of any other breeder. On ten occasions in twenty years Mr. Sandars has secured the highest individual price, and on thirteen occasions has he had the highest average. To him belongs the honour of the record price, for a Lincoln Red, that of 305 guineas, which was paid by Mr. Cockbain for "Scampton Jodreef" (4569), a bull destined for Chile.

White versus Yellow Maize.

Maize growers have frequently enquired of us lately which are the most profitable kinds of maize to grow for export and whether in view of the greater demand in Europe for yellow grain, it would not be advisable to grow yellow in preference to white maize.

In order to obtain definite information on this point four samples of Rhodesian maize were recently forwarded to England for examination and report, and we have pleasure in acknowledging our indebtedness to the London Corn Exchange, Messrs. Fear, Colebrook & Co., Ltd., Southampton, Messrs. John Jackson & Co., Glasgow, and Mr. George Roffey, London, for the following information received:

The four samples were designated A, B, C and D, respectively.

- A.—Was a sample of Hickory King which would be graded as “choice,” or under the new grading regulations, No. 1.
- B.—Was an f.a.q. or grade No. 2 sample of Hickory King.
- C.—Was a “choice” sample of Boone Country.
- D.—Was a “choice” sample of yellow maize representative of either Golden Eagle or Yellow Hogan.

In all cases the maize was reported to be of excellent quality, and by each authority the samples were placed in the following order:

Choice Hickory King or *large flat white* commanding a premium of about 6d. per quarter (480 lbs.) over any of the others. F.A.Q., Hickory and “choice” Boone County of about equal value, and yellow maize about equal in value to f.a.q., Hickory or Boone County, but on some markets worth 3d. to 6d. per quarter less.

Messrs. Fear, Colebrook & Co., stated that:—“If there were a very large import of the white flat maize and a comparatively small import of the yellow flat maize the latter would command *quite as good a price as the former* but with such a

small general import as we usually have from South Africa, we think the white would as a rule be worth more than the yellow."

Messrs. John Jackson & Co., enlarge on the subject in the following terms:—"For export purposes we suggest that the Rhodesian farmer will certainly obtain better results by growing white maize. The reason for this is that the supplies of white maize available for the United Kingdom and the Continental markets are limited to certain parts of the United States of America, South Africa, the Argentine, the Danubian Provinces and South Russia, so that the competition in it is certain at all times to be more intense. Of course the value of white maize will be governed more or less by the value of yellow but for certain purposes white maize will bring a substantial premium. South African and Rhodesian maize are eminently suited for the commercial requirements of this country, and it is all a matter of price. The Rhodesian grower will require to compete with other maize growing countries, but he certainly has an advantage in his quality being of a higher standard than the maize from the United States of America, and as we have said for certain purposes, to that from South Russia, the Danubian Provinces and the Argentine, and judging by the size and colour of the berry he is extremely fortunate in the climate and the soil."

It thus appears that the English trade is expecting better prices to be realised for white than yellow maize, while at the same time there is little doubt that the use of white maize for manufacturing purposes is being extended, and will thereby bring about an increased demand. In certain quarters it has been suggested that the demand for white maize is more or less limited and that consequently if too much maize of this type is produced the supply will be in danger of exceeding the demand. This is no doubt correct in theory but it must be remembered that few countries do produce any large amount of white mealies and that the whole export of Rhodesia for many years to come is but a fraction of the world's requirements. At the same time it appears reasonable to suppose that in the event of an over production of white maize values would drop to the same level as that of yellow maize and not necessarily below it, since of one thing we may be certain, namely, that as far as possible maize for feeding purposes will be bought in the cheapest market, and

should the value of white maize decline owing to over production, the market price of yellow will probably fall in sympathy with it, and in any case would be unlikely to retain a premium over white maize. Presuming this deduction is correct it would appear that till over production takes place white maize is always likely to command a small premium, and, under almost any circumstances, to be of equal value to yellow maize. The weight of the above evidence, coupled with the fact that yellow maize meets with but uncertain demand within our own territory, together with the knowledge that the white varieties already grown are entirely suited to local conditions, and will generally give as good, if not better, results than yellow, all point to the advantage of adhering to the production of white maize.

In certain experiments carried out by the Mississippi Experiment Station in seven different States, it was shown that when 217 white varieties were grown in comparative trials with 273 yellows, the advantage in yield of the former was at the rate of about two and a half bushels, or 150 lbs. per acre. On referring to the variety trials carried out at the Government Experiment Farm, Potchefstroom, Transvaal, and extending over several seasons, it will be seen that of the ten heaviest croppers, five are white varieties and five yellow.

It would therefore appear that there is little or no difference between the average cropping powers of yellow and white maize, provided that they are grown under equally favourable conditions.

With regard to the kind of maize most profitable to export, it has been shown that the *large flat white* usually commands a premium, and that No. 1, or "choice" of this type is worth about 6d. per quarter or approximately 2½d. per bag more than any other except perhaps Cinquantino.

The monetary advantage of producing a No. 1, grade sample, over an output of three to five thousand bags is therefore no inconsiderable item in the profits derived from the crop and it may again be emphasised that the difference between grade No. 1 and grade No. 2, or even below grade, depends mainly on uniformity of berry and on freedom of the grain from trash and dirt, both of which are entirely at command of the grower to make or to mar.

Soil Fertility and Organic Matter.

By G. N. BLACKSHAW, B.Sc., F.C.S.,
Government Agricultural Chemist.

If a soil is carefully examined, the presence of decomposed organic matter is readily discernible, much has however undergone decomposition to the extent that its original vegetable structure has been lost, and a spongy dark material, called humus, been produced. It is of humus (decomposed vegetable matter) that this article treats in the hope of making clear to those concerned its value as a factor in soil fertility, and the great importance of taking measures to maintain in our soils, as far as practicable, an adequate amount of this constituent. Humus is valuable under all conditions, but particularly so in a hot climate, such as ours, subject to extended periods of dry weather and to very heavy rains during the wet season. The organic matter, from which humus is formed, is derived from many sources, the chief in the case of unmanured land being the roots of plants. The rate of decay of vegetable matter in the soil is influenced by many conditions, more especially by the aeration, the water content and the temperature of the soil. In places where decomposition is slow, a considerable amount of organic matter is accumulated, but in cases where it is very rapid, the humus content is invariably low unless the soil is continually replenished with it by cultural methods. Evidence of this is to be found everywhere, our rich black vleis for example contain a considerable amount of organic matter, whereas in the sand veld the amount present is generally speaking at a minimum. The reason for this is very apparent, in the vleis, apart from the ranker growth of vegetation there found and the greater quantity of decomposable material, the presence of an abundance of water throughout the greater part of the year checks the rate of decomposition, the water serving to keep down the temperature and prevent to some extent the access of air; in the lighter soils, owing to more perfect drainage, the water, air and temperature conditions are more suited to active fermentation and loss of organic matter.

Having briefly explained the origin of humus and the conditions which influence the amount present in different classes of soil, let us next consider wherein lies its value in improving a soil's cropping capacity. The effect of humus upon soils is both chemical and physical; from the chemical aspect it provides nitrogenous plant food, nitrogen being one of the four elements of plant food in which a soil is liable to be deficient. The effect of humus upon the physical condition of soils is very marked, and those not already alive to its value in this respect will see that, whatever the cultural methods adopted may be, the presence of organic matter in sufficient but not excessive quantity is absolutely essential if the best is to be got out of the soil.

The effect of humus upon the water content of soils requires consideration. Soils which contain a high percentage of humus will always resist drought better than those in which the humus content is low, for the reason that humus is both a strong absorbent and retainer of water. On light soils it has a pronounced binding effect thus rendering the soil much more retentive, the humus acting somewhat like a sponge and so checking the rapid passage of water into the deeper layers of the soil. In the case of heavy soils humus causes the fine clay and silt particles to aggregate into small irregular masses thereby making the soil more porous and consequently more absorptive of water which might otherwise run off the surface. The importance of humus as a conserver of moisture and the decline in the retentive power of soil for water consequent upon the loss of humus is illustrated by the following observations, taken from a number of others, made at the Minnesota Agricultural Experiment Station, U.S.A., on samples of soils obtained from similar fields containing different amounts of humus:—

WATER CONTENT OF SOILS CONTAINING DIFFERENT AMOUNTS OF HUMUS.

New soil cultivated two years.		Old soil cultivated 22 years.
	per cent.	per cent.
Humus ...	3.75	2.50
Water ...	16.48	12.14

In this example the difference of 4.34% of water in favour of the soil with the larger amount of humus is equivalent to $1\frac{1}{2}$

quarts of water per cubic foot of soil. These two samples of soil were placed in shallow trays and exposed to the sun (temperature 85° F. humidity 58) for ten hours. The soil with 3·75% humus retained 6·12% of water while the soil with 2·50% humus retained 3·94% water, a difference of nearly a quart of water in a cubic foot of soil.

An excellent example to show the effect of applying dung¹ on the retentive power of the soil for water and the yield obtained in markedly dry seasons is afforded by the plots at the Rothamsted Experiment Station, England. After a spell of nine days dry weather, 0·262 inch of rain fell on September 12, 1904, and on the following day (the 13th) samples of soil were taken from manured and un-manured plots on the heavy loam soil of the Broadbalk field, the water content of each being determined with the following results:—

PERCENTAGE OF WATER RETAINED IN BROADBALK
WHEAT LAND.

Depth.	Un-manured.	Manured.
0" to 9" ...	16·0	19·3
9" to 18" ...	19·8	17·0
18" to 27" ...	23·3	18·4

It will be seen that the dunged plot retained a much greater quantity of water in the surface. nine inches, the difference being 3·3 per cent. in its favour, showing that the surface soil had retained practically the whole of the preceeding light rains, whereas in the un-manured lands the water rapidly sank into the subsoil.

The increased water retaining power of the dunged plot naturally manifests itself in very dry seasons, as the following example also afforded by the Rothamsted Experiment Station shows:—

In England the year 1879 was exceptionally wet and cold and 1893 hot and dry during the growing season. The rainfall for the four months, March to June, was 13 inches in 1879, and 2·9 inches in 1893. The following table gives the yield of wheat on plots 2 and 7, the former of which received a dressing of dung at the rate of 14 tons per acre, and the latter a complete dressing of fertilisers.

WHEAT—Yield in bushels of Grain.

Plot.	1879	1893	Average for 51 years.
2	16'0	34'25	35'7
7	16'25	20'25	32'9

It will be noticed that in the wet year (1879) there is very little difference between the yields on the two plots, but in the dry year (1893) the superiority of the dunged plot was very marked, the difference in its favour being 14 bushels—the average difference between the plots being less than 3 bushels calculated from returns extending over a period of 51 years.

Humus exerts a marked effect on the physical condition of a soil. Except in the case of coarse sandy soils, the difficulty of getting soils into good tilth is frequently experienced. Moisture is of course one of the chief contributing factors in the preparation of a satisfactory tilth, and we have already seen that humus has a very material influence upon the water content of soils. Its value in this respect does not however end here, for the very fact that it makes the heavier types of soil more porous by aggregating the finer particles into small masses affects in great measure the friability of the soil. The action of humus upon the physical condition must have been brought very forcibly to the notice of many who have had to deal with our red soils for a number of years; in the experience of many, one might almost say of all, it has been found that on red land which has been under crop for a number of years, great difficulty is experienced in getting the soil into good tilth; one frequently sees that such land has worked up into lumps which it is well-nigh impossible to break down except by hand labour. The tendency of arable land, the red soil more particularly, to work into lumps increases year by year. The chief reason for this is undoubtedly the gradual diminution in the amount of organic matter or humus present. A loss of humus must always result from the cultivation of the soil and the removal of the crop from the land, for the reason that cultivation exposes the soil particles to the action of the air and to the full heat of the sun's rays, thereby causing the gradual burning off of organic material, and inducing, in the presence of moisture,

very active fermentation. Consequent upon the loss of humus in cultivated soils, the aggregations of soil particles, formed in the presence of organic matter, are broken down by the action of rain, and, in the case of the heavier types of soil, a puddled condition of the surface results. This puddling of the surface causes, on subsequent drying, the formation of a hard crust, so hard in fact that great difficulty is experienced in breaking it down. On the score of its physical action alone, therefore, quite apart from its moisture-retaining properties and content of nitrogenous plant food, the great importance of maintaining an adequate amount of organic matter in our soils must be very manifest.

That organic matter is a very valuable constituent of soils is evident, and the fact that its loss, in the case of our red soils particularly, detrimentally affects the physical condition and workability of the soil is proof of the necessity of making provision to replenish it in organic matter from time to time by the application of kraal manure. By some it may be said that the application of kraal manure is out of the question, for the amount produced each year on the farm is merely a bagatelle, being sufficient to dress a few acres only. Whilst this may be so in the majority of cases to-day, most farmers will agree that a very much larger quantity of kraal manure can be made in the year on the average farm by providing a superabundance of bedding in the kraals than is made at the present time. However small the number of stock on the farm, sufficient kraal manure can always be produced to do a small acreage, and surely it is better to dress a few acres than none at all. The policy of taking out and putting nothing back is bound to place the arable farmer in very serious difficulties sooner or later. Such being the case the question will naturally suggest itself to the farmer—Am I doing the best I can in the circumstances to keep up the fertility of my land? If he can conscientiously answer in the affirmative, all is well and good; if the answer is negative, then a further question should present itself, viz.:—Can more kraal manure be made on the farm than has been made hitherto? If more can be made then by all means make it and utilise it for those lands which have been under crop for some years.

The advisability of green manuring (ploughing in green stuff) on maize lands is rather a moot point, the contention being that, where it is practised, cutworms become particularly troublesome.

Poultry.

THE MANAGEMENT OF BARNYARD FOWLS THROUGHOUT THE YEAR.

By PHILIP L. HALL, Somerset, Lower Gwelo.

Having had occasion to notice the conditions under which chickens are reared on many farms in this country, I was impressed by the fact that the average farmer has a long way to go before he realises anything like a satisfactory return from his feathered stock. Certain progress has been made recently, but the mortality that still goes on among chickens on the average farm is appalling, and until this is checked by better management the farmer's poultry will never be as remunerative as it should be. In some places one may observe an attempt being made to give the chickens a better chance for life by cooping the hens with their broods in an orchard or paddock, which, so far as it goes, is a move in the right direction. In many cases, however, these coops are placed so close together that the advantages which the secluded run might have afforded are nullified. I have in mind an instance of five coops each containing a hen and brood—the latter varying in ages from one to six weeks—all placed within a few yards of each other. There was plenty of space in the wired in enclosure, yet here were these unfortunate chickens all herded together, many of them diseased or full of ticks, some injured by the pecks which a neighbouring hen delivered them at intervals, and all, big and little, scrambling for the food, which was thrown every time on to the same piece of ground immediately in front of the coops, and much trodden and fouled in consequence. The coops were never moved, and it was simply a struggle for the survival of the fittest among the chickens. More than half had died and it was obvious that there would be very few "fittest" left in a month's time. That is not an isolated case, but one of several, and which helps us to understand why so often the farmer thinks poultry does not pay him. Nothing is to be gained by rearing in such an unreasonable manner. The whole error is simply the outcome of thoughtlessness or ignorance—perhaps both—and it is really as easy, and much more pleasant, to bring up chickens in a natural way, as it is to muddle along in a worn out rut. There is no

doubt but what the best way to run the young chickens is by cooping the mothers, in some secluded spot where stock will not upset the coops, and for preference amongst bush or under trees which afford shade from the sun and a certain amount of protection from hawks. But unless the broods can be kept at least 20 feet apart, and the coops moved every few days to a clean spot, I would rather see the chickens and their mothers at liberty. When there is plenty of natural food about, an intelligent hen will almost provide for all the wants of her brood if she is given the chance of doing so; but few mothers seem to realise the dangers which may result from trailing their broods through long wet grass, or from over-tiring the chickens by too much foraging. Then again, the fact of a number of chickens of varying ages running together must militate against success, for the youngest must always suffer. The broody hen with quite a young flock will usually keep them out of the way of older stock for some weeks; but as soon as she begins to tire of them—usually at the most critical period of the chicken's life—she is apt to allow them to mix with the miscellaneous collection of feathered stock common to the average farm-yard. Then they have to shift for themselves. They cannot hold their own against numbers of older birds. They consequently receive a set back in their growth, which means that they either become affected by some disease, or hang on through a prolonged and precarious chicken-hood long after the date at which they should commence making a return to their breeder. There is loss in any case, and the farmer says they don't pay! I am fully alive to all the difficulties which lie between the farmer and his fowls, especially at this season when every section of his holding is clamouring for attention. But the fact that some farmers can, by giving them proper attention, make their poultry a very profitable branch of their work, goes to prove that others can also do so if they choose. And it is in a great many cases not want of knowledge which stands between the farmer and successful poultry keeping, but lack of enterprise, industry and confidence. The idea of making poultry really profitable on a farm is such a novel one—and one that is so often unsubstantiated by actual experience—that only the bolder spirits among our farmers will risk the investment of a little capital on this branch of their profession.

With the coming of summer the poultry keeper enters upon a new phase of work. Most of the chickens will be grown up, hatching and rearing almost at an end. But not the least important business connected with the young stock is the sorting out of those of different sexes and sizes into separate flocks. The wastrels, too, must be rigorously weeded out. All those with weak legs, crooked spines, wry tails, or other deformities, or any which depart too widely from the ideal aimed at, whatever that may be, must not be permitted to remain. They will only occupy space to no purpose, and are unsightly, discreditable objects at the best. Market birds also must be cleared as soon as ready, for nothing will be gained by keeping them longer than is necessary and all available runs should be given to the new permanent stock.

Then there are the old hens, which have just passed their second year. They must all go, unless there are a few exceptionally prolific individuals that are worth using for another season in the breeding pen, or a bird possessing some distinctive characteristic which the breeder is anxious to perpetuate. Poultry is just now fetching the very best price for a very long time past, and the opportunity should be taken to get rid of the old birds. Great age does not appear to be any drawback on the market, which is fortunate, for there are many specimens in our farm yards whose birth certificate must be lost in the limbo of antiquity. If they are not fat it will pay to make them so by shutting them up in a pen and feeding on scalded maize meal and flat mealies as a grain. This will give the weight which is wanted by the buyers in a very short time. There is nothing to gain and much to lose by keeping old hens about the place. They lay few or no eggs; they occupy land that might be supporting young and profitable stock; they are often diseased; have enormous appetites, and indolence seems to be their strong point. People who only keep a few fowls can use up their old birds for the table, and a two-year-old is by no means to be despised if cooked properly. The best way to prepare such a bird so that it may cook quite tender is to fast it thoroughly before killing, and then to hang it in a cool place for two days. After trussing it may be boiled for about half-an-hour and then roasted in the ordinary way. Then the flesh will be as tender as that of a chicken, and have a much better flavour.

Although most stock cocks will do well for a fourth season, they should be carefully observed when they attain that age. Much infertility at hatching time, want of vigour and tone, indicated by the birds frequently becoming spiteful in the breeding pen, and a continued "out-of-sorts" appearance for any length of time, are symptoms which should not be tolerated in any stock bird. It is wiser to market all such with the old hens, and go in for new ones. In any case, the male birds should not be allowed to run with the hens all the summer; if they will be required for mating in the autumn and winter. They must either be provided with small houses and moveable runs attached, usually termed cockrel runs, or they may be turned down with the cockrels, so long as there is not any very serious fighting.

All stock will be the better for a change of run, in the autumn. If there are any chickens still in the weaning stage, they will be given a greater impetus by change of run, and the rearer may be warned of the fact that much time is lost if the youngsters receive a check in their growth now. Late broods must not be kept too long with the hens, and coops and brooders still occupied should be frequently moved on to clean turf. Vermin will begin to increase towards the end of summer, wherever it can find an opportunity, so that a sharp look-out is desirable for any chickens which are drooping from the effect of ticks, or which show any symptoms of gapes. To avoid the latter disease, and also as a preventative from others all the birds' drinking water should have a lump of camphor kept in it, and it must be in a cool shady spot. Wet or damp land is more congenial to the propagation of the gape worm than a high and dry place, so that the latter should always be selected as a rearing site if the disease be suspected. Chickens which have pneumonia often sneeze and gape as though they were suffering from gapes, and the novice will do well, if in doubt, to examine a dead bird. All he has to do is to slit open the wind pipe with a fine pair of scissors, and if the disease is gapes, some very small thread like worms of a blood red colour will be found therein; or lower down in, or at the entrance to the bronchial tubes. If on the other hand, the trachea is clogged with mucus, and the lungs as well as being inflamed, contain fluid, particularly at the back, the birds may be treated for pneumonia. This treatment consists of providing shelter from the wind by day and giving more space and fresh air at night. Some linseed meal may be added to the food, and a few drops of chlorodyne mixed to each half part of drinking water.

Resin Wash for Scale Insects on Citrus Trees.

By RUPERT W. JACK, F.E.S., Government Entomologist.

The use of resin wash as a remedy for scale insects on citrus trees has already been referred to under the heading of Notes from the Agricultural Laboratories in this Journal (see Vol. VII., No. 4, April, 1910,) but certain comparative tests with modifications of the standard recipe have since been carried out by this office, and the results combined with other additional information to form the present article. It must not be imagined that the use of any wash is recommended in preference to fumigation with hydrocyanic acid gas, which is the most effective remedy known to economic entomology at the present time. Many citrus growers, however, who have not very extensive orchards shrink from the initial cost of a fumigation outfit, and frequently become supporters of some patent spraying liquid or of some preparation of a cattle or sheep dip, never intended for application to fruit trees, resulting often in injury to the foliage only. The writer is far from being prepared to condemn *all* patent remedies for scale and other fruit tree troubles, or even to state that preparations of dips are altogether without value, but he has no hesitation in stating that there are a number of so-called remedies on the market, supported by a surprising number of testimonials from fruit-growers, which border on the useless as far as their alleged efficacy on fruit trees is concerned. The practical fruit grower is as a rule prepared to spend money on an application which requires the minimum of trouble to prepare, and a wash which only requires dilution to be ready for use is naturally preferred to one which entails the use of a cooking pot and the expenditure of a certain amount of time and care. On the other hand, the same man would probably be surprised to learn

that he frequently has to pay for the patent of his proprietary wash and for the vessels in which it is put up. By using a recipe he is assured of one thing, namely, that he is paying only the retail value of the ingredients of the remedy. He may also be assured that in using such a recipe as resin wash, he is taking advantage of the results of years of experimental work by specially trained men who have had no other end to serve but to find a cheap and effective remedy for the pests concerned.

The history of resin wash is not without interest. In the year 1886 the United States Department of Agriculture detailed Mr. D. W. Coquillet and Mr. Albert Koebele to investigate the question of remedial washes against the scale insects which were causing very serious damage to the orange groves in California, and against which the soap and kerosene (paraffin) emulsions considered effective in the Eastern States, were found to be not altogether successful. The investigations continued for several years, and amongst other substances tested were caustic potash, caustic soda, hard and soft soaps, tobacco soap, whale-oil soap, vinegar, Paris green, resin soaps and compounds, etc. Finally there was evolved a formula for a resin wash which was considered to combine cheapness and effectiveness in the most economic proportions. This formula, published in 1889 by Coquillet and termed "the best solution for use during the latter part of the year," is as follows:—Resin, 18 lbs., Caustic Soda (70%) 5 lbs., Fish Oil, $2\frac{1}{2}$ pints, water to make 100 gallons. (American gallon equals about $\frac{3}{4}$ Imperial gallon). In 1890 a modified formula omitting the fish oil and using 40 lbs. resin, 5 lbs. caustic soda (77%) to make fifty gallons of wash. These washes came into very general use in the citrus groves of California, the formulae including fish oil being generally preferred.

The effect of insecticides is apt to vary with the climatic conditions, and when the Cape Colony appointed an official entomologist in 1895, amongst the earliest work undertaken by him was the testing under South African conditions of

The above particulars are mainly taken from Prof. Lodeman's "The Spraying of Plants."

the standard formulæ recommended in the United States. Amongst those tested was resin wash. It was found that the Californian recipe could not be improved upon, and that when applied hot, was very effective indeed. Comparative tests were also made with the same formula omitting the fish oil, and the results obtained were to the effect that whilst resin wash without the fish oil was effective when applied hot against soft scale, it is not so effective pound for pound of resin as the formula containing fish oil against red and other hard scales. The Californian formula, expressed in Imperial gallons was therefore recommended for use in the Cape Colony, and implicit directions for preparing it were given. The formula and directions are taken from "Remedies for Orchard and Vineyard Pests," published by the Western Province Board of Horticulture, Capetown, 1904, and may be termed the standard for South Africa.

Resin ...	...	...	24 lbs.
Caustic Soda 98 ¹ / ₁₀	...	...	5 lbs.
Fish Oil	...	...	2 bottles.
Water to	...	...	100 gallons.

Crush the resin, which may easily be done by pounding it in a meal sack. Put fifteen gallons or more water in the cooking pot, stir in the soda and oil, and bring to a boil. Then gradually stir in the powdered resin, never letting any settle, and boil for ten or fifteen minutes after all is dissolved and the solution is like strong coffee in colour. The preparation may take less than three quarters of an hour if the resin is well crushed and not allowed to settle, but may take two or even three hours if the resin collects in a mass. Add hot water, or cold water very gradually, if mixture foams up strongly, and when cooking is complete bring amount of liquid up to twenty-five gallons at once. Good until used, and should keep without settling; if settles, boil until all again dissolved. Remaining water, hot or cold, may be added at any time. When made without fish oil, the wash seems practically as good as with it for soft scales and for aphides. If fish oil is not procurable and the wash is needed for hard scales, use six pounds of good soft soap in its place. Resin wash at two-thirds the strength given is strong enough for most aphides, but for Woolly Aphis full strength wash had best be used.

Fish Oil is not procurable at every local store in inland South Africa, and to some extent this may deter some of those who grow but a few trees from the use of resin wash to destroy the harder scales, and it is these smaller growers who are in a position to benefit most from the use of the wash, as those who have larger orchards and could afford to procure fish oil by the drum are more likely to face the heavier outlay of a fumigation outfit. It occurred therefore to the writer that some other oil, more generally procurable, might be used as a substitute for fish oil without loss of efficiency and without adding to the cost of the preparation, as does the use of the 5 lbs. of soft soap recommended as a substitute by the Cape Colonial Entomologist. The literature on the subject gives no suggestion in this direction, fish oil being apparently one of the cheapest and easiest procurable in the States. It was decided to try Raw Linseed Oil, and a small series of experiments were undertaken which included also the use of a cheaper hard soap instead of soft soap. These experiments were made on but a few trees, but the results were so clear that the writer has no hesitation in publishing them. It was first ascertained by making a number of preparations in the laboratory that both Raw Linseed Oil and hard soap (Primrose Soap) would produce a clear compound when the wash was prepared in terms of the standard formula, though both required rather more water to dissolve the last trace of sediment than the wash made with the fish oil. This was of no moment, however, as all sediment was dissolved readily even by the addition of cold water long before the dilution necessary for application to the trees was reached. As a matter of fact the wash prepared without oil or soap was found to be still less soluble.

The next step was to make comparative tests of the different washes on the trees. Four solutions were prepared in accordance with the formula given by the Cape Colonial Entomologist, as follows :—(1) Plain resin soap, *i.e.*, omitting both oil and soap (2) Using 5lbs. of Primrose soap instead of two bottles of fish oil (3) Using two bottles of raw linseed oil instead of fish oil (4) Standard wash containing fish oil. It was found more convenient to apply these washes cold to the trees. As the tests were merely comparative it was thought unnecessary to expend the time and trouble necessary for heating the water.

The first experiment was made with five citrus trees in a Salisbury garden infested with red scale. One tree was sprayed with each of the preparations and one kept as a control. The first application was made on 27th August, 1910, and a second on 12th September. The tree selected for the raw linseed oil preparation was the heaviest infested, being literally covered with red scale. Young scale was not very plentiful on any of the trees. The day of the second application but little difference could be detected in the trees. The bulk of the old scale was dead in each case, but living females and an occasional crawling larva were to be found. A week after the second application, however, it was apparent that the plain resin and primrose soap applications were not as effective as the other two, while the raw linseed oil formula had killed practically all the scale. An examination on 22nd December shewed that scale had considerably increased on the trees sprayed with plain resin and the Primrose soap formula, whilst those treated with the raw linseed oil and fish oil formulae were almost free from scale and markedly thriving.

In a second experiment all the trees were very badly infested with red scale, but those used for the fish oil and raw linseed oil formulas were the worst, and were in fact in a condition that would have caused many fruit growers to uproot and burn them. Two trees each were sprayed with the plain resin and the Primrose soap formulas, three with the raw linseed oil and four with the fish oil formula. The first application was made on 8th September and the second on 22nd September. There were several control trees. The results from the first shewed in the favour of the raw linseed oil and the fish oil formulas, and the final note made on 22nd December was to the effect that the trees sprayed with plain resin and the Primrose soap formula were both very bad with scale, were suffering a good deal, containing a quantity of dead wood, and were making no growth, whilst the trees sprayed with the two formulas containing the oils, which at the time of application looked like succumbing altogether to the scale, were growing out well again and had but little live scale. One of the trees sprayed with fish oil was an exception, for although a great deal had been destroyed, the scale was increasing rapidly again. None of the trees, however,

were quite free from live scale. Some of the controls were very bad indeed showing a great quantity of dead wood and but scanty foliage.

These experiments indicate that resin wash prepared according to the standard formula, with the substitution of raw linseed oil for fish oil is as effective as when fish oil is used, and more effective than when the oil is altogether omitted, and raw linseed oil is as cheap and more easily procurable than fish oil in our territories.

A Salisbury firm quotes the following prices for the chemicals used in preparing resin wash :—resin, 6d. per lb., caustic soda (98 per cent.), 9d. per lb., fish oil or raw linseed oil, 7 6 per gallon. The price of raw linseed oil fluctuates, and though at the time of writing 7/- per gallon is the lowest quotation, a few months back it was as cheap as 5 - per gallon. The cost per gallon of the preparation at the dilution recommended for use on citrus trees is then about 2¼d., exclusive of the labour involved. The quantity of the liquid to be used naturally varies with the size of the tree. For medium sized trees about three gallons is sufficient, thus costing about 6¾d. per single application per tree. If the surroundings are favourable, that is to say, if there are no badly infested trees close by to re-infest the treated trees, two thorough applications of resin wash with an interval of about three weeks should be sufficient for two years.

The Red Scale apparently breeds fastest during hot dry weather, and it is at this period that applications are likely to have the maximum effect, as the young is more easily killed than the older scale. Thus in California, where the summer is the dry season, growers are advised to spray in August and September. In the Western Province of the Cape Colony where the summer is dry, February and March are indicated as the best months. Although the writer has had no opportunity of carrying out the extensive tests that would be necessary to positively determine the best season to spray in Rhodesia, the marked increase of red scale in November and December suggests these months as very suitable for the purpose. In general it is best to avoid spraying the trees whilst in blossom, and possibly

whilst bearing fruit. Spraying with resin wash will destroy scale at any season of the year.

A separate article on spray pumps appears in this issue, and will furnish the necessary information to those who wish to use resin wash on their citrus trees. The Bordeaux is a very suitable nozzle for applying this wash, and the Vermorel fitted with the cap for throwing a coarse spray is also excellent.

The citrus grower should bear in mind that the presence of scale in abundance on his trees injures the health of his trees, kills the wood, impairs their growth and fruit producing qualities and prevents the proper maturing and ripening of the fruit. If the scale is not attended to, the orchard will decrease in value year by year and may finally become almost worthless. Fumigation is the best remedy; if this is not considered practicable, resin wash is the best preparation with which to spray.

Instruction in Dairying.

REPORT OF A TOUR IN RHODESIA.

By Miss E. A. MAIDMENT.

In accordance with arrangements made by the Directors of the British South Africa Company on the recommendation of Professor Wallace and Mr. C. D. Wise, Director of Land Settlement for Rhodesia, I proceeded to Rhodesia for the purpose of giving a series of:—

I.—LECTURES.

- (a) On the possibilities of dairying in Rhodesia.
- (b) The best and most profitable methods of milk production.
- (c) The most sanitary methods of treating and preparing milk for human consumption.
- (d) Poultry keeping and the general management of poultry.

2.—DEMONSTRATIONS.

- (a) How to test the quality of milk.
- (b) How to prepare milk and cream for sale.
- (c) How to prepare cream and make it into the best quality of butter.
- (d) How to make two varieties of cheese suitable to the country under existing conditions.
- (e) How to pack produce for transit by post and rail.

I collected and took with me for demonstration purposes the following apparatus:—

- (1) A good and suitable churn and butter worker for a small dairy.

- (2) The most simple and reliable separator.
- (3) The most simple and convenient weighing machine and tablet for weighing and recording yields of milk from individual cows.
- (4) The most sanitary strainer for straining milk.
- (5) A household sterilizer.
- (6) A refrigerator or milk cooler.
- (7) Bottles, fibre, discs, and labels showing how milk should be put up and sealed for delivery in towns, or to the public, anywhere.
- (8) Bottles for sterilising.
- (9) Bottles for pasteurising.
- (10) Bottles and special labels showing how to make and put up Bulgarian Butter Milk in the best form for distribution.
- (11) Pure cultures of Bacteria for making starter for cream ripening, also for Bulgarian Butter Milk.
- (12) The different constituents of milk in separate tubes, showing exactly of what milk is composed.
- (13) The Gerber dirt tester, which is used to detect imperfect straining or dirty milk.
- (14) Simple appliances for making two kinds of cheese :—
 - (a) The Rhodesian Cheese-de-Luxe.
 - (b) The Rhodesian Wensleydale.
- (15) Specially designed labels and packing for cheese and butter.
- (16) Tin-foil, wrappers, and a specially designed butter box for hot climates.

On arrival at Cape Town, I was met by your representative Mr Olive who with great patience and courtesy helped me through all the difficulties of landing in a strange country, and he handed me the programme which has been prepared by the Agricultural Department on receipt of my request, forwarded from London, that a tour should be arranged prior to my arrival, so that no time should be wasted. This programme I rigidly adhered to until quite the end, when it had to be slightly altered for various reasons,

The following centres were visited :—

				Number of people attended.
Plumtree	...	...	...	20
Figtree	..	...	...	23
Bulawayo	...	...	...	60
Matopos (Mr. Hull's farm)	...	...	...	6
Innesfallen	...	...	...	20
Eldorado	...	...	..	25
Umboe	...	...	...	12
Marandellas	...	...	...	40
Umtali	...	...	...	60
Premier Estate	...	...	...	40
Rusapi	...	...	...	20
Mazoe	...	...	...	30
Homefield	...	...	...	25
Salisbury	...	...	...	50
Gwelo	...	...	...	100
Umvuma	...	...	...	40
Total				571

Great disappointment was felt that visits to the following centres could not be arranged :—Bembesi, Somabula, Enkel-doorn, Kalomo (N. West Rhodesia), Lobatsi (Bechuanaland).

Thus 17 centres were visited besides individual farms, and I think we may safely say that considerably more than 571 (nearer 600 people) attended all the lectures and demonstrations. At each of the places visited people came very long distances, and were all most keen on discussing the whole aspect of dairy farming.

I delivered 44 lectures on dairying and poultry keeping, and gave 65 demonstrations on butter making, cheese making, milk testing and various other subjects, besides giving continual information to individuals.

Without going into unnecessary detail with regard to the arrangements made locally by the Farmers' Associations and their representatives and by individual farmers and others at each separate centre, I should like to express my sincere thanks to one and all for their kind hospitality to myself,

and to those who came long distances to attend the meetings. Although the accommodation and convenience was, in many cases, primitive, and our lecture and demonstration room was more often than not the stoep or verandah of the farm house (or the veld itself, under the shade of a leafy tree with anything handy for seats), it had its advantages. Most of the beautiful homesteads of Rhodesia are built on the highest suitable site of the farm which usually averages about 3000 acres, so there was always plenty of fresh air and a glorious view of the lovely country for hundreds of miles, which fascinated me so much I was never tired of looking at it.

In the towns we had a good public room and every convenience, but the meetings at the farms were quite as proportionately well attended and were very enjoyable.

I tried to show, in the short time at my command, the possibilities of dairying and how important it is to a country like Rhodesia to produce its own food, especially fresh milk, which is such a very valuable article of food in every household; and I find that there is every encouragement to the farmer to develop this profitable industry. At present the demand for all dairy products exceeds the supply, and during 1909, £35,000 worth of dairy produce was imported into the country, as follows:—

SOUTH AFRICAN PRODUCE.		NOT SOUTH AFRICAN.	
Tinned Milk	... £54	... ..	£13,396
Butter ...	... £6,510	... ..	£9,908
Butter substitutes	... —	... ..	£828
Cheese ...	... £345	... ..	£4,246

This is a state of things which surely should not exist, especially the enormous import of tinned milk—it must be bad as a general substitute for fresh milk—and would be an industry and source of revenue to the farmer and the country as well.

The reason probably that up to the present dairying has not been more largely developed is that when the people were settling, there was very little railway accommodation and also the knowledge of how to prepare milk for distribution in a sub-tropical climate was very little understood. Further, dairying involves rather more capital, organisation, care and attention than the farmer is prepared for in the

early days (the country is even still very young), and he has to be content with cattle raising for beef and transport, maize growing, poultry keeping, and perhaps later, tobacco growing.

Some few farmers have taken up dairying on a fairly large scale near the towns of Salisbury and Bulawayo, and other populous centres, and made it very successful, but even in those places it is quite common to see milk distributed in old whiskey bottles with no particular sanitation about the cork or the bottle, whilst fresh cream table use is an unheard-of luxury and generally unobtainable. The price of milk is 6d. per whiskey bottle or 3/- per gallon, and butter is from 1/9 to 3/- per lb., while the average price of eggs is 2/6 per dozen. Any doubt as to whether there is a market for dairy produce may be dispelled by a glance at the imports, and as to *future* prospects there is every indication of a general development in the mining industry all over the country, which means increased railway facilities and a larger home market than ever.

I think I may say, without presuming to dispute the opinion of those who have had a wider experience of the country than myself, that from what I have seen, and from what I have proved by experience of a practical nature, Rhodesia is a country in which dairying can be successfully developed with advantage to its people and to its revenue. Although milk production, cheese making, and butter making on a large scale with cold storage, expert dairy management, the formation of factories, and general facilities for a large export trade will not be developed all at once, it will come in time with education and co-operation. What is required at the present time is a system of instruction and instructive experiments which will develop the industry gradually, and on the right lines, so that Rhodesia may at least supply her own markets at no very distant date with milk, cream, butter, and cheese.

If ordinary precautions are taken there are no unsurmountable difficulties in keeping and feeding suitable dairy cattle, and in making and marketing dairy produce, in perfect condition, at any season of the year; and when one considers the present price of beef and maize as compared with milk

and butter, it is very surprising that the farmers, now that they are becoming established, do not go in largely for dairying, and convert their maize into milk. But before much headway can be made, more attention must be paid by intending dairy farmers to the following important points:—

(1) The selection and breeding of suitable dairy cattle. (2) The housing and feeding and general management, including milking. (3) Provision for a uniform supply of milk at all seasons of the year. (4) The rearing of calves on dairy farms. (5) The formation of co-operative associations, at all possible centres, for the collection and marketing of dairy produce, and for the manufacture of butter and cheese, as this lessens the cost of production, ensures uniformity as well as a market.

With regard to the respective merits of the different breeds, and the most suitable breeds for the country, very few farmers will as yet be able to establish herds of pure bred stock, and must be content to improve existing cattle of the country by importing good animals from England for crossing.

I saw some very good Lincoln Red Shorthorns at Mr. Hull's farm in the Matopos, and the quality of the butter made from their milk is excellent, while the Friesland cattle give such a poor quality of milk and butter that they are not to be recommended. The cattle of the country give milk of an excellent quality but they are not amenable to civilised methods of treatment, at least so I was told. For instance, they cease to give milk if the calf is taken away; but without describing in detail the weird and wonderful methods of putting the cattle into kraals, and the milking process both in Matabeleland and Mashonaland, I must say it was the funniest thing I ever saw in my life, and I have yet to be convinced that a cow could not be trained to give her milk, if properly managed, after the first calf. Under the present system it is impossible to milk cows properly, and both cows and calves suffer. If the calves were taken away and reared separately, and the cows, which are now kept for dairy purposes, were thoroughly milked, we should hear less about swollen and diseased udders and calf sickness, and there would be a very much larger quantity of milk yielded by the cows which are kept.

The housing of dairy cattle is important. I saw very few good cowsheds in the country ; there are some, but the majority of the cattle are put in kraals at night which are no protection as they are simply pieces of ground, with either walls built round or thick bush fences. Sometimes there are posts in the ground inside the kraal to which the cows are secured with much persuasion for the milking process. Cow houses should be more generally built, as milking cows would do better if sheltered during the cold nights, and there would be greater opportunities of training the native servants in the proper management of cows both for milking and feeding.

The winter feeding of dairy cows is a very important question, and should be more generally adopted. Whatever the breed of cattle may be, they must be fed during the winter months if the milk supply is to be kept up. Silage made from the green maize stalk just when the cob is formed is most excellent, and grass and teosinte can also be made into silage. Hay can also be made with advantage to the land as well as well as to the cattle. Lucerne, mangels, rape and oats (given green as fodder), some of the native grains, sweet potatoes (which grow abundantly) and pumpkins are all much relished by the cattle. Silage is especially valuable, and considering the present price of maize would, I should think, give a much larger return as a milk producer; whilst the labour involved in making silage would not be greater than shelling and putting the grain in bags. Some of the grain on each farm should of course be ripened, as it is a useful food stuff mixed with other things.

There is great scope for experimental work in the direction of calf feeding. The use of cream substitutes, such as linseed and cod liver oil, are almost unknown, or are considered too expensive to import. Linseed can be grown in the country, and, though so far, very little has been attempted, it will without doubt be grown in large quantities in the near future, as the farmers realize its enormous value. Mr. Wise is at present trying to formulate a feeding ration for calves from some of the native grains, but it is doubtful if anything will be found as easily digested and as valuable as linseed for young calves. I had no opportunity of discovering what the cost in the country would be of cod liver oil suitable for calf

feeding. It is to be hoped that experiments in feeding young calves with different foods will be carried out at some of the Government Farms and the results published. I have brought home samples of the native grains, and am having them analysed with the object of trying to formulate a mixture which would be equivalent to the foods required by a young calf in addition to separated milk. It would also be most useful if a ration for dairy cattle could be made up of grains and foods grown in the country.

The farm dairy of Rhodesia is excellent, and fulfils the requirements of the most fastidious. It is always an isolated building in a shady spot, with walls of wattle and daub or Kimberley brick. The latter is best, as it is firmer, and can be more easily whitewashed. The roof is usually thickly thatched with native grass (the natives excel in this kind of work) and generally drops low over a verandah which gives great coolness. There is often an air space of from 6 to 12 inches between the top of the walls and roof, and there are also air windows in the walls. The dairy at the Premier Estate (one of the Chartered Company's Home farms) is one of the best I have ever seen and perfect in every detail. It has a splendid verandah running round it, protected by mosquito netting, and I was delighted to find that the separator was in a small open building near the cowsheds and not in the dairy, as most of the labour of separating, etc., is done by natives. This is very important, and in any case in a hot climate as little work as possible should be done in the dairy itself.

I found separators quite general; some bad, but mostly good. There are also very nice churns and butter workers, but there is too great a tendency to use a steel churn which I do not like at all. A few people have cheese-making apparatus but do not use it owing to lack of knowledge. On the whole the appliances in the country are good, and a great point, which is more hopeful than anything, is that the people are most anxious to *learn* how to use them to the best advantage.

Cheese making is at present the most important thing to them, but they were equally glad to have the opportunity of seeing butter made by an expert and were more than sur-

prised at the importance attached to the use of a thermometer and even to the importance of methods at all. The reason cheese making is such an important thing to them at present is that they may use up surplus milk to the best advantage during the rainy season, as although there is a great scarcity of milk for many months in the year on account of the lack of feeding and other reasons, there is a great flush during the short rainy season, and then it is difficult to dispose of it. If made into butter it does not keep well, as at present there is very little accommodation for cooling either cream or water on a large scale, and there is no central cold storage. So what is required at the moment is the knowledge of how to make a cheese which can easily be manufactured under present conditions, and after discussing this matter with Mr Wise in London in March last, it occurred to me that the small Wensleydale would be the most suitable cheese to meet the requirements of the country, and for these reasons :—(1) It is a cheese of good quality ; (2) Very easily made ; (3) Requires very little experience and no plant except an ordinary vessel to make it in, and a breaker and moulds which can be bought for a few shillings ; a press can be improvised ; (4) It is a very popular cheese, similar to a mild and creamy Stilton if made soft and quick ripening, but if made firmer and drier and harder pressed, then it is similar to a Cheddar ; (5) This cheese can be made from 2lbs. to 5lbs. in weight which is an advantage in a country where everything dries quickly, and this size would find a ready sale in the towns or on the mines at a very remunerative price ; (6) There is no shrinkage or waste. When the cheese is ten days old, or dry enough, it can be dipped in paraffin wax, which is odourless, and almost invisible ; it is then absolutely protected from the dryness of the climate, and can be stored anywhere in a cool airy place ; (7) The cheese will keep from 2 to 6 months according to method making and taste of consumer ; (8) A ripening or store room for this cheese can be made under the dairy, or some place which will maintain a uniform temperature of about 60° Fah. I was told that the temperature of the cellars of the Club in Bulawayo, which are three parts under the surface, has only varied five degrees the last three years, viz. :—from 60° to 65°. We named and labelled this cheese "The Rhodesian Wensleydale."

A second cheese was shown also—a French cream cheese—very easily made and very profitable, but perishable. It is very attractive properly packed and suitable for home use in any household. Most of the people who saw them remarked that they would be a most useful change of food which they could make for themselves, even if too far from a market to sell large numbers. I think, however, they would sell very well and could be sent by agricultural parcels post. In any case farmers near the towns would have a good market, especially in hot weather, as everyone who tasted this cheese was delighted with it. This cheese I named "The Rhodesian Cheese-de-Luxe."

Before concluding the somewhat brief report I should like to say that I proved beyond a doubt from practical experience that Rhodesia can produce the finest cheese and butter in the world. In spite of great disadvantages always encountered when an audience has to be considered, I made some of the finest butter and cheese that I have ever seen. The butter was marvellous, as I often had to make it in the afternoon in a temperature of 85° Fah. with no means of cooling either natural, or otherwise, and in spite of all disadvantages it resembled the produce of our best Channel Island cattle which is always of a firmer texture and higher quality than the produce of other breeds. I think the altitude or the breed of cattle, or the dry feed of the veld must one or all have a very marked effect on the character of the butter, and this point offers a very interesting field for research. Having proved that Rhodesia can produce the very first quality of dairy produce, the next important thing is to go ahead and produce more of it. There is more valuable material waiting to be developed in Rhodesia than in any part of the British Empire. The land is there; the climate is glorious; there is shade, plenty of water, and a good market. A splendid lot of men (many of whom are pioneers whose invaluable services for the country cannot be over-estimated), are ready to work on right lines given help and encouragement, and settlers of a good stamp are arriving every week to take up farms and make their homes in this beautiful land of sunshine, sport, and freedom.

The most striking example of how a dairy industry may be developed is shown from what has been done in Denmark

and Canada. For instance, 30 years ago Denmark was one of the poorest countries in Northern Europe, but now, according to one authority, the national wealth of Denmark is supposed to be at least £230 per head of the population as against £247 for England, and that it is increasing year by year. This is a remarkable fact, as there are very few industries except agriculture in the country, but the magnitude of its export may be grasped when we see that in 1908 Denmark exported to England alone 20 millions pounds worth of butter, bacon and eggs.

Canada has also made the most marvellous strides in this direction during the last 20 years, and now not only supplies her own needs but her exports are enormous, and in each and every case development has been brought about by the same thing—education—followed by co-operation, or associations assisted by the Government, and a good organisation.

If we go back to the early histories of the now enormous educational and commercial organisation of these and other countries, which have been equally successful, we shall find they all had very small beginnings. I am hoping that we shall find at no very distant date that the pioneer work which I have had the honour of inaugurating in Rhodesia, will be the beginning of a new era in the dairy industry of the country (both educationally and commercially) and consequently of its prosperity.

There is not only every opportunity for successful agriculture but the country is full of romantic interest and beautiful scenery. The Matopos, with its magnificent wild rocky scenery, is worth going all the way to see. The lonely grandeur of this beautiful spot so appealed to the great and noble founder of the country that his grave is there in the very midst of the most impressive view in the world, very rightly named "The World's View." It is incomparable. The Victoria Falls are more wonderful, and in comparison with Niagara, their beauty and grace are indescribable. There is not a fall or a view, but a whole succession of falls. They do not meet you or stare you in the face. They have to be sought, and seen again and again at different times and in different lights. Like some beautiful phantom or vision they only appear in all their glory when the moonbeams or sun-

beams make them exquisite and fascinating beyond description. No description or photograph can give any idea of the magnificent beauty of this wonderful place, and one wonders what must have been Livingstone's feelings if the Grand Fall was bathed in vivid rainbows when he first saw it. Rhodesia is to be congratulated on having, in addition to all its other charms, two of the Wonders of the World, and the journey to go and see them is so easy and Cape Town such a delightful place to visit on the way that everyone should "go and see."

I do not despair of a good supply of dairy produce at The Falls Hotel for tourists who appreciate the luxury of milk and cream. I found a creamery is being started at Kalomo, and the farmers were anxious for me to go and help them with advice. I was very disappointed I could not do so. I hope some day to see all the developments of which I think the country is capable being carried out, and I would ask all Rhodesians to remember the importance of the words of a great American, viz., "The agricultural interest of any country is connected with every other, and is superior in importance to them all."

Indigenous Rubber.

In the month of July, 1910, two samples described as Rubber were received from the Administration of North-Western Rhodesia, under the native name of Muliya. Specimens of the tree from which the rubber was obtained were also forwarded for determination and on examination in the Botanical Laboratory the Muliya tree proved to be identical with the so-called Rhodesian rubber tree, M'Toa, Umgamamasane (*Gonioma Kamassi*) order, Asclepidaceae.

The M'Toa tree is widely distributed throughout Southern Rhodesia, and enquiry is sometimes made as to whether the latex might not be of some commercial value. To those acquainted with the tree the following report, received from the Imperial Institute, South Kensington, London, will be of interest:—

MULIYA RUBBER, No. 1.—Weight about 6 ozs..

The sample consisted of a lump of rather soft material, light-brown externally and greyish-white within. It was very

moist and contained a little vegetable impurity in the form of bark, etc. The material was sticky and evidently of resinous composition; it exhibited very little elasticity or tenacity.

				Material Composition as of dry received. material.	
Moisture	...	...	per cent.	25'5	—
"Caoutchouc"	...	"	"	21'9	29'4
Resin	...	"	"	45'2	60'7
Proteids	...	"	"	1'9	2'6
Insoluble matter	...	"	"	5'5	7'3
Ash	...	"	"	1'0	1'3

Material of this type would have very little if any commercial value.

The material described in the above table as "caoutchouc" was left after extracting the resins with acetone; it consisted of a blackish, slightly sticky, rubber-like substance, which was fairly tenacious but possessed little elasticity.

MULIYA RUBBER, NO. 2.—Weight about 10 cz.

The sample consisted of a lump of rather soft reddish-brown material, containing a considerable amount of fine fragments of bark to which the colour was probably due. The material was very moist and resinous; it resembled the preceding sample in physical properties but was not quite so sticky.

				Material Composition as of dry received. material.	
Moisture	...	...	per cent.	29'2	—
"Caoutchouc"	...	"	"	12'7	17'9
Resin	...	"	"	39'2	55'4
Proteids	...	"	"	2'9	4'1
Insoluble matter	...	"	"	16'0	22'6
Ash	...	"	"	0'7	1'0

Material of this type would have very little if any commercial value.

The material left after extracting the resins with acetone, and described above as "caoutchouc," consisted of a reddish-brown material, free from stickiness but exhibiting poor physical properties. This sample of the product was not so well prepared as No. 1. It contained a much larger amount of vegetable impurity and less "caoutchouc."

Notes from the Agricultural Laboratories.

ENTOMOLOGICAL.

SNOUT BEETLE DESTRUCTIVE TO MAIZE.—The little beetle figured in the adjoining plate has been responsible for a very considerable amount of damage to the young maize crops near Salisbury this year, and rumours of damage further afield have also reached this office. In many cases practically the whole of a planting of maize has been destroyed before the plants had reached the height of six inches, and the replantings have also suffered very greatly. At the time of writing (January) the beetles are still abundant and destructive on certain farms, and the cessation of their attacks does not appear to be in sight. One farmer reckons that 250 acres on his lands have suffered, and 60 to 80 acres have been absolutely consumed and have been re-planted. Others complain of two plantings having been destroyed.

The length of the beetle is about three-eighths of an inch, and the colour is a dull reddish-brown. The shape may be seen from the illustration. The damage is done by the adult beetles which devour the leaves of the plants, often eating them right down to the ground. The beetles are mostly to be found during the day in the sheltered centre or heart of the plant, and in a fair-sized plant 20 or 30 may be found at a time. When disturbed they "sham dead," letting go their hold on the plant and curling their legs up close to the body. If they reach the ground in this way they lie still for a minute or two and then commence to crawl rapidly, and coming into contact with the plant again, make haste to regain their former position.

The writer is unacquainted with the details of the life history of this insect, but it is probable that the larvae live in the ground and feed on the roots of plants as is the habit with certain allied species. The writer has found what is possibly the larvae of this species under the ground in infested fields. In regard to the other stages we are at present altogether ignorant. From such information as can be

gathered it appears that this pest is not a new one, but that it has occurred this season in unusual numbers. The farmer who had 250 acres attacked this year lost only about twenty last year. The general opinion appears to be that the white stork (*Ciconia alba*), commonly known as the large locust bird, usually does good service in keeping them under. In the maize fields the beetles are in an excellent position to be attacked by birds, and no doubt a dozen or two of storks, if they really have a taste for this insect, would soon practically clear a field of the pest. The absence of locusts this year may have reduced the number of storks in the Territory and this might explain to some extent the abundance of the beetles. However this may be, the beetle is with little doubt a native of the country, and is either especially abundant this year through a partial failure of its natural checks or it is developing a special taste for maize, and in this case may become a serious pest in the future. This particular pest is not known to entomologists in the rest of South Africa, and appears to be purely Rhodesian.

Practically no advice can at present be given in regard to preventive or remedial measures. Careful study of the life history and numerous experiments may evolve some method by which the pest could be controlled. The reported liking of the white stork for the adults suggests that running fowls or turkeys in the infested fields might have a very beneficial effect, and this is well worth a trial where the birds are available. Other control measures will probably lie in the direction of modified measures of cultivation, but sufficient information is not available as yet to indicate what form such modification should take. It is safe to say, however, that planting the land to some other crop for a season might be tried.

The Entomologist is much in need of additional information concerning this pest, and any farmer reading these notes who may have suffered from the beetle during this or any other season, will be conferring a favour if he will write to the Agricultural Department, furnishing any notes on the subject that he may think of interest.

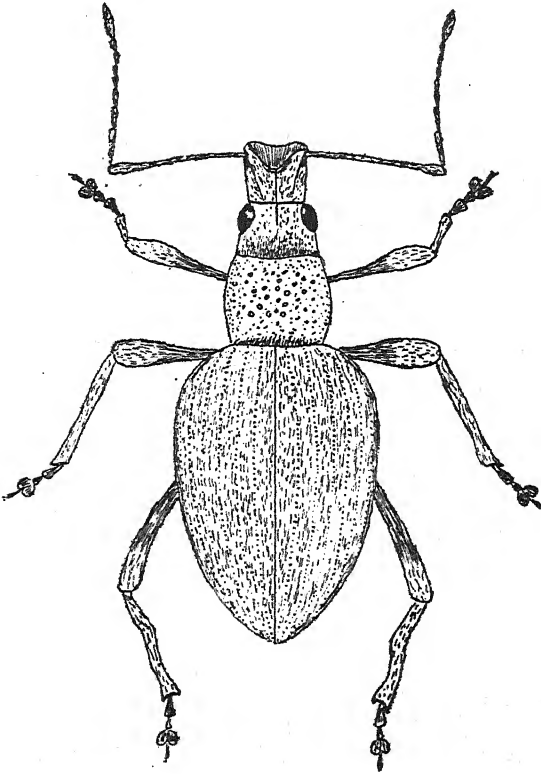
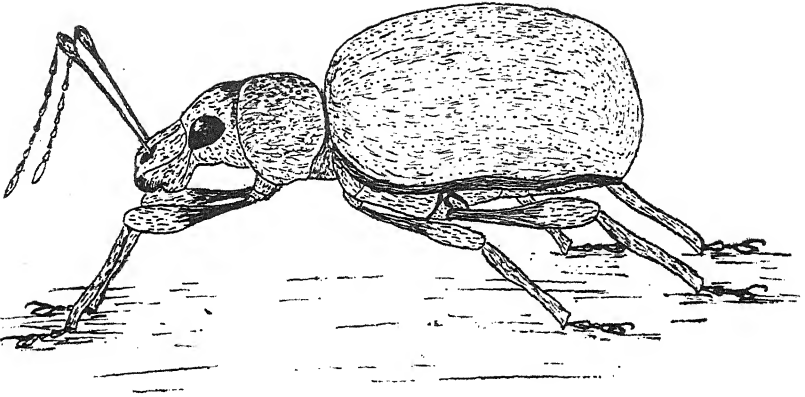
The points on which information is more particularly required are (1) The number of years the infested land has been cropped to maize (2) The loss this year (3) The loss in former

years (4) The time the previous crop was harvested (5) Whether the previous year's stumps were burned or not (6) The presence or otherwise of volunteer maize on the infested lands (7) When the land was ploughed (8) When the damage ceased in former years (9) Whether "locust birds" have been observed about the infested fields (10) Any methods of control that may have been tried and the success attending such (11) Whether the pest has been known to attack other crops.

Whether this pest prove of an intermittent or permanent nature, the damage that has been done by it this season makes it advisable that we should learn more about its habits as soon as possible.

TORTOISE BEETLE ON SWEET POTATO, ETC.—The sweet potato furnishes sustenance to a variety of insects. Amongst others the foliage seems very attractive to leaf-eating beetles, and not least to the sub-family which comprises the Tortoise Beetles. The writer has seen as many as five different species of these beetles on one small plant at the same time. The little beetle, of which the various stages may be seen figured in the adjoining plates, has this season however, far exceeded in numbers all the others that favour the sweet potato, and has in some parts done noticeable damage to the plants in spite of their luxuriant growth. Besides the sweet potato, it has attacked to a serious extent another plant of the same genus, namely the *Ipomoea* creeper so commonly grown over wire netting in this Territory, and in addition has been abundant on the leaves of melon plants.

The beetle itself shews a wonderful variation in colouring. In some adults of both sexes the wing covers are entirely black. Plate I, Fig 1, shews such a specimen, but the colour values in the photograph are not correct and the distinction between the yellow of the thorax and the black of the wing covers can hardly be detected. In others the wing covers are yellow, spotted with black (Figs. 2 and 3), and in rarer cases they are entirely yellow. The form of the pupae can be seen in Figs. 4 and 5. The lighter parts are yellowish white and the darker blackish. The pupae are usually attached to the leaves, but are sometimes found on the petioles or stem. An empty pupa-case is shown at the top of the group in Fig. 5. The adult beetle emerged from this case during the photographic operations. The spotted forms.



Snout Beetle, destructive to Maize.

The position shown is not intended to be natural ; legs and antennae being arranged to show their characteristic form.

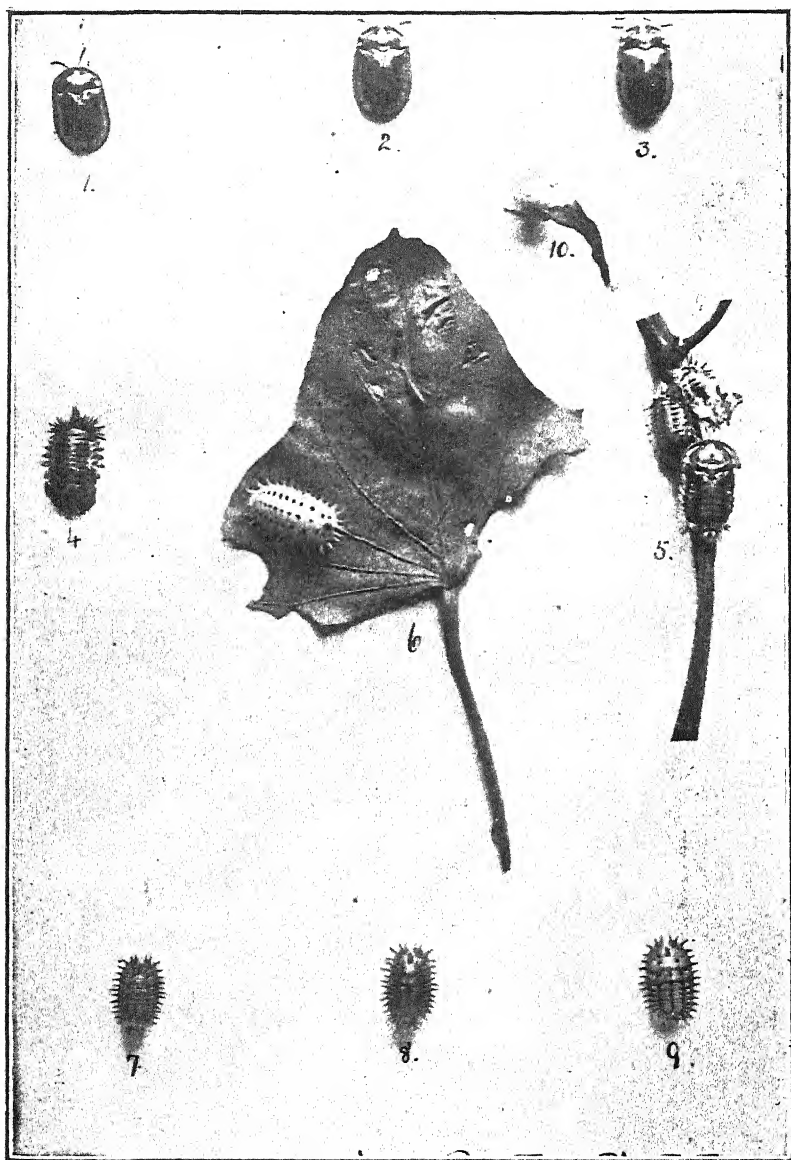


Plate I.—Tortoise Beetle on Sweet Potato.

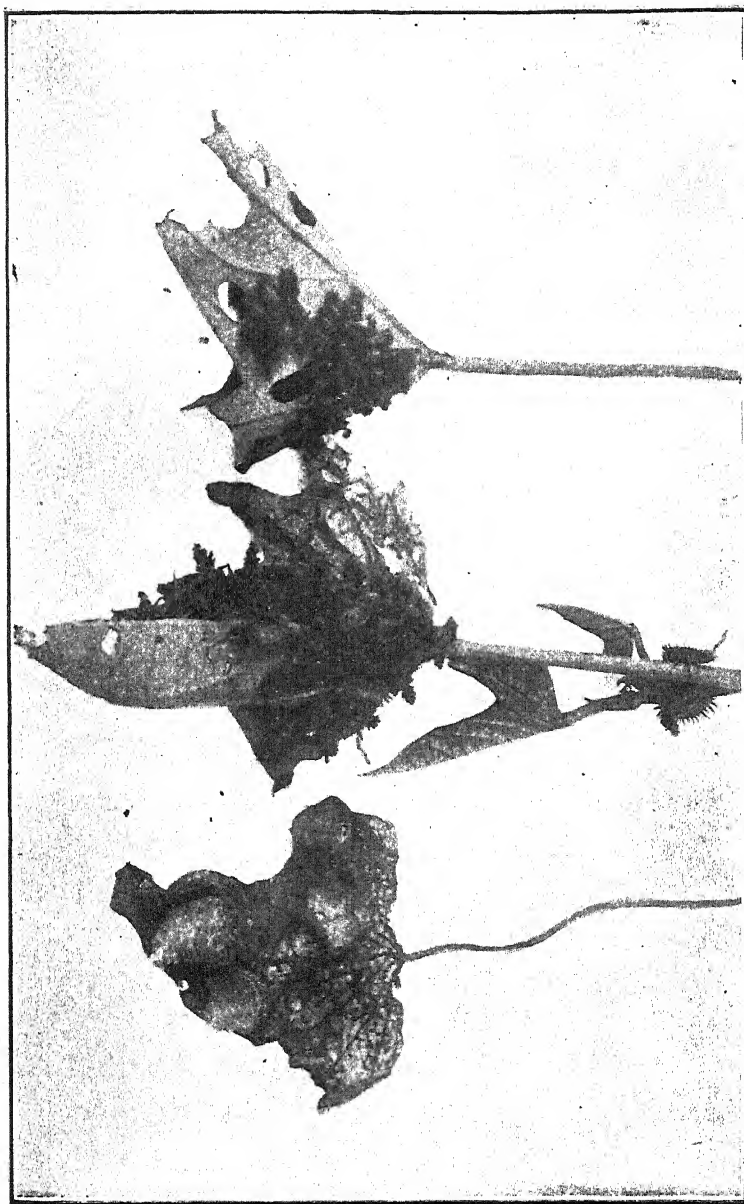


Plate II.—Tortoise Beetle on Sweet Potato.

when they emerge, are all yellow, and develop the black spots later. The writer has not yet observed the emergence of the form with black wing covers. The larvae (Figs. 6, 7, 8 and 9) are spiny little grubs which feed exposed on the surface of the foliage. The anal end is furnished with two hooks which curve over the back and serve the peculiar purpose of holding the old cast skins of the larva over its back, for what object it is difficult to conjecture.

After the last moult this bundle of old clothes seems to be lost. A full-fed motionless larva about to pupate is shown *in situ* at Fig. 6. The egg-clusters are exceedingly interesting. One of them is shown at Fig. 10, and three on the left hand leaf in Plate 2. Each cluster consists of about ten tiny thin sheets of a semi-transparent substance like a number of watch glasses fitted into one another. Each of these sheets bears four eggs in a row across the centre, their long axes parallel to each other and vertical to the surface of the leaf on which the cluster rests. The eggs themselves are whitish, soft and more than twice as long as broad. At one end the cluster terminates in an irregular mass of the semi-transparent substance. This is judged to be the beginning of the cluster. The other end is covered with a sheet similar to the others but containing no eggs. The young larvae on emergence devour the leaf on which the egg cluster rests, usually leaving it a mere skeleton (Plate 2, left hand leaf). Until about half grown they are of a gregarious nature and feed in groups, as is shewn in the middle and right hand leaves of Plate 2, where two clumps of differently developed larvae are shewn. Later they feed singly.

This pest can easily be destroyed by spraying with arsenate of lead. The writer has found 1 lb. in 20 gallons of water to kill them fairly well, but recommends 1 lb. in 16 gallons of water to give quicker results.

R.W.J.

TORTOISE BEETLE *RE* SWEET POTATO.

EXPLANATION OF PLATE.

1. Adult—elytra all black.
- 2 and 3. Adults—elytra red spotted black.
4. Pupa.
5. Pupae *in situ*. Adult beetle emerged from top skin whilst photo was being taken.

6. Full fed quiescent larva on leaf, about to pupate.
- 7 and 8. Larvae bearing tufts of cast skins.
9. Nearly full fed larva without tuft.
10. Egg cluster.

CHEMICAL.

During the year a number of earths have been submitted by farmers for report regarding their suitability for brick-making. The following analysis gives the mechanical composition of an earth which was obtained from "Southmore" Farm, Mazoe. The material occurs two to ten feet below the red soil and makes a capital brick.

	Per cent.
Coarse gravel, over 3 m.m. ...	1'08
Fine gravel, 1—3 m.m. ...	3'75
Coarse sand, '2—1 m.m. ...	16'82
Fine sand, '04—'2 m.m. ...	33'62
Silt, '01—04 m.m. ...	27'93
Fine silt and clay, less than '01 m.m. ...	10'41
Loss on ignition ...	6'31
Calcium carbonate ...	0'12

ANTHEAP LIME.

There is an impression among Rhodesian farmers that in many cases antheaps contain a sufficient amount of lime to be of value for agricultural purposes. Analyses have been made of several samples sent in for report, but in no case was the lime content sufficiently high to render its use for "liming" soils practicable. The following is an analysis of a sample, taken from an antheap containing lime, sent in by Mr. Finch. of Marandellas :—

	Per cent.
Silica and refractory silicates ...	73'24
Iron oxide and alumina ...	5'94
Calcium carbonate ...	9'37
Magnesium carbonate ...	2'13
Water and organic matter ...	8'47
Undetermined ...	0'85
	100'00

This sample only contains 9.37 per cent. of calcium carbonate, which is equivalent to 5.25 per cent. quicklime. The amount of lime present is so low that it is questionable whether any benefit that might result would repay the expense involved in applying an adequate dressing of the material. In this country an ordinary dressing of *unburnt lime* of good quality in a fine condition is one to two tons per acre. Taking the very light dressing of one ton, to apply an equal quantity of lime in the form of material similar to the sample forwarded, at least nine or ten tons per acre would be required. Fineness is also of very great importance as lime of the same order of size as clay and silt particles is more effective than many times its weight in visible pieces. A large proportion of the lime present in antheaps not being in a particularly fine condition, and the pulverising thereof being impracticable, it would really be necessary to apply a much heavier dressing than ten tons per acre of the above material.

G.N.B.

Cookery for the Country.

By L. C.

TINNED MEAT COLUMBIA SANDWICHES.

Pass through a mincing machine a small piece of tongue, add some minced watercress (narsturtium leaves do very well), a few drops of Worcester Sauce, a pinch of black pepper, salt to taste, 4 tablespoonfuls of melted butter, and a $\frac{1}{4}$ lb. of finely chopped nut meats (almonds, walnuts, or monkey nuts, or fresh cocoanut). Mix to a smooth paste and spread between thin slices of brown bread.

SAVOURY OMELET (Baked).

Separate the yolks from the whites of three eggs, and mix with the yolks two tablespoonfuls of milk, two ounces of fine brown bread crumbs, a tablespoonful of chopped mint (or some prefer thyme), and salt and pepper to taste. This should be a thick batter, if necessary add a little more milk. Whisk the whites separately to a stiff froth, and quickly stir into the batter. Pour into a buttered dish and bake in a rather quick oven.

A very good sauce to serve with above is as follows :—Cook together for about a quarter of an hour the pulp of two large tomatoes, two teaspoonfuls of finely chopped onions, 1 oz. of grated cheese, 1 oz. of butter, salt, pepper, and a dash of nutmeg. When cooked, run through a gravy strainer, and add just enough cornflour to thicken slightly.

CHEESE FINGERS.

Blanch 2oz. of sweet almonds, cut each in four, and fry them in butter until a golden brown, and drain. Mix together a tablespoonful of fresh cream, two tablespoonfuls of grated cheese, a good pinch of pepper and salt and a tablespoonful of chopped parsley. Spread this mixture on fingers of toast about $1\frac{1}{2}$ inches wide, sprinkle the fried almonds on top, and serve very hot.

CELERY STICKS.

A Cold Savoury.

Clean some celery heads and cut the nicest white sticks into short lengths. Fill the hollow side with the following mixture, and serve on a bed of lettuce or garnished with parsley, half a cream cheese („Rhodesian cheese de luxe”) one ounce of butter, some salt, cayenne, mustard and finely chopped parsley.

COLD SWEET OF APPLES OR ORANGES.

Soak half-an-ounce of gelatine in a pint of cold water, and when soft add six ounces of sugar, and a teaspoonful of essence of ginger. Turn the whole into a stewpan and let it boil for five minutes, then put two pounds of apples (pared, cored, and quartered) into the liquid, but not broken. Take out the apples, and arrange them in a mould, previously rinsed out with cold water; colour the liquid with cochineal, strain it over the apples, and turn out when cold. Oranges peeled, and separated into quarters, may be substituted for the apples, about six oranges, and rather more sugar.

A VERY QUICKLY PREPARED COLD SWEET.

Cut up some preserved ginger about the size of peas, and put a teaspoonful of these, and a very little of the syrup, in each of some little ramequin cases. Fill up the cases with whipped cream, flavoured or not, as preferred, and serve immediately, or rather, fill up the cases with the cream just before serving.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1911.									
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Rhodesia. Landowners and Farmers ...	Bulawayo ...	Harry Hopkins	27	24	31	28	26	30	28	25	29	24
Midlands ...	Gwelo ...	M. L. Price	14	11	11	8	13	10	8	12	9	11
Mashonaland ...	Saltbury ...	P. B. Snashall	14	14	4	1	6	3	1	5	2	4
Manica ...	Umtali ...	H. F. Savory	14	14	4	1	6	3	1	5	2	4
Hartley ...	Hartley ...	V. W. Fynn	14	11	11	8	13	10	8	12	9	11
Mazoe ...	Mazoe ...	P. W. Kidwell	21	...	25	...	20	...	22	...	23	...
Lomagundi ...	Eldorado ...	C. M. Wright	...	...	...	...	...	...	...	...	...	...
*Marandellas ...	Marandellas	Rev. A. J. Liebenberg	28	25	25	29	27	24	29	26	30	28
*Central ...	Umvuma and Enkel- doorn alternately	...	...	...	...	...	...	...	...	...	...	...
North Umtali ...	Sunmerfield and Nakasaba Mission	R. H. O. Blurten	7	...	4	...	6	...	1	...	2	...
Victoria ...	Victoria...	T. Rutherford	...	4	...	1	...	3	...	5	...	...
*Victoria (Eastern)	Good Hope Farm	F. A. Readman	...	15	...	19	6	21	1	16	2	20
*Macheke ...	Macheke	G. F. Kidson	7	4	4	1	...	3	...	5	...	...
*Meisetter ...	Lower Meisetter	D. M. Stanley	...	...	...	...	...	...	...	...	...	...
Gazaland ...	...	J. W. Scott	5	2	...	6	...	1	6	3	...	7
Plantree ...	Plantree	J. Reid-Rowland	...	...	...	...	...	...	...	...	...	...
*Ffigtree ...	Figuree ...	I. T. Kirschbaum	7	4	4	1	6	3	1	5	2	4
Makoni ...	Rusapi ...	F. A. Lapham	...	...	...	...	...	...	...	...	...	...
Matopo ...	Matopos...	W. E. Dowsett	...	...	5	...	...	4	...	...	...	...
Makwiro and Norton	Makwiro	F. R. McClellan	...	...	9	2	...	8	...	...	...	...
Kimberley Reels	Kimberley Reels	G. O. Smith	...	...	...	...	...	4	...	...	...	...
Somabula and Shungani Flats	Somabula	S. Annandale	...	...	4	1	6	3	1	5	2	4
Headlands ...	Headlands	H. Barnes Pope	...	...	...	...	...	...	...	...	...	...
Marula ...	Marula Siding	MacW. Ingram	28	25	25	29	27	24	29	26	30	25
Umvuvuvu ...	Mt Tembarra Mission	N. N. Rutherford	...	...	4	...	...	3	...	...	...	30

* Date Uncertain.

† Dates not Supplied.

Correspondence.

CATTLE BREEDING.

To the Editor *Rhodesia Agricultural Journal*.

Sir,

I have read Major Gordon's article on "Cattle Breeding in Rhodesia" in the October issue of this Journal. If space permits I should like to comment on it.

The gist of the article appears to be that, though Rhodesia is undoubtedly a good cattle country, we are on the wrong tack as long as we make use of the "local females" even though we may be using bulls of an imported breed. With all due deference to Major Gordon, I must emphatically disagree with him there.

No doubt many of the native breeds are very inferior specimens of the race, but they have that to be said for them, and this is a strong point in their favour, they are red-water proof and acclimatised.

Major Gordon says that since improved bulls have been successfully acclimatised, heifers should do well. Granted, but he leaves out of consideration that to start farming one or two bulls are sufficient, whereas it requires at least twenty-five to fifty heifers.

It might pay a dairyman near town to risk the importation of a few heifers or cows, but when discussing cattle breeding, ranching on a larger scale with far more beasts is meant. It would be, I venture to think, difficult to obtain from red-water veld in Cape Colony, sufficient good cattle to supply even a few of the larger ranching propositions in this country, and when we come to importing from non-redwater veld or oversea, the risk of loss is so great that I doubt whether any one who has ever tried it would care to repeat it on a large scale. It is not only red-water—the original attack of which is often successfully overcome by imported stock, but more still the reactions of red-water and difficulties of acclimatisation which make the risk so great,

I have myself imported three bulls from England, the first a Coates Shorthorn, the latter two Red Lincolns.

The first died from red-water, the latter two revived and though they have been doing remarkably well and have been running with the herd at all seasons for the past two years, it took six months of unremitting care and attention, the constant taking of temperatures and dosing, and careful feeding.

It is beyond any doubt that this trouble is well worth it, with a limited number of sires, but would anyone be prepared to take the same risk and trouble with say 50 to 100 imported heifers.

As regards Colonial-bred heifers, I imported 10 shorthorn heifers from red-water veld, only one is to-day alive and a stunted animal at that. I put it down to inability to acclimatise, and being from red-water veld I naturally did not take the same care of them that I did with the bulls imported from oversea.

I have a very different story to tell of the results obtained by crossing locally bred Africander heifers with my Red Lincoln bulls. In every instance the calves have taken more after the sire, they are sturdy, thick-set, with nice level back and plenty of flesh, and at the same time they have inherited the natural hardiness of their mothers. Very possibly in the second and further crosses there may be some "throw backs," but at any rate this method of breeding will be more financially sound, as there will not be the initial loss from red-water and inability to acclimatise which, I am afraid, would be a feature of any importation on a large scale of pure bred cattle from outside Rhodesia.

Without doubt also, a very large proportion of cross-bred stock out of our local cows by thoroughbred sires will compare very favourably with the stock of other countries, even though we cannot expect to produce as good cattle as the Argentine and Australia straight away.

We have on the spot a hardy strain of native cows, it remains for the progressive cattle breeder to improve on this by importing good sires and to maintain the improvement of the progeny by winter feeding and greater care.

Surely we must hope to produce a strain of cattle which "would not be shot at sight" by ranchers in other parts of the world.

Yours truly,

GERALD FITZGIBBON.

Mount Shonnon, Salisbury,
28th December, 1910.

GRASS BURNING.

Centenary,

Figtree,

Nov. 22, 1910.

Dear Sir,

Very many thanks for your answer about grass fires (No. 579—61/576). The information is so valuable that I think it would be advisable if it could be printed in the "Rhodesia Agricultural Journal," also that Native Commissioners should impart this knowledge to the natives, who firmly maintain that the burning of grass is most desirable.

I am,

Yours truly,

GEORGE J. WILKERSON.

The letter referred to by the Rev. Mr. Wilkerson of the Centenary Mission was as follows:—

15th November, 1910.

Dear Sir,

In reply to the enquiry contained in your letter dated the 9th instant regarding the arguments against veld burning, the following are among the most important:—

(a) When the veld is burnt grass seeds whether still in the seed heads or lying exposed on the surface of the veld are destroyed, and natural reproduction of the grasses by seed is therefore retarded.

(b) After the veld has been burnt the first vegetation to make regrowth is frequently the strong perennial veld weeds and herbaceous bushes which are mostly worthless for stock feed, and which consequently overshadow the grasses and gradually crowd them out.

(c) The humus or decayed vegetable matter, which, in the ordinary course of events, would result from the dead grasses is destroyed and the soil is thereby impoverished both of actual plant food and of the constituents which assist the soil in retaining moisture.

(d) Following on the previous point, heavy rains falling on burnt veld beat the surface of the ground hard, and to a great extent run off without being absorbed as would be the case were the surface covered by a mulch of decaying vegetable matter.

(e) Cattle once having had access to young grass resulting from burnt veld, and which contains but little nourishment, usually refuse old grass of which, on unburnt veld, they are compelled to eat a certain amount when searching for the new growth, and thereby require to travel further in order to obtain a full meal.

Yours faithfully,

(Signed) H. GODFREY MUNDY,
Agriculturist and Botanist.

Weather Bureau.

TEMPERATURES.

STATION.	NOVEMBER.		DECEMBER.	
	Max.	Min.	Max.	Min.
Bulawayo	78·5	57·3	82·6	58·8
Chishawasha	78·6	55·9	80·2	57·2
Empandeni	82·7	59·3	84·9	59·9
Giant Mine ... ..	...	...	...	...
Gwelo	78·6	54·7	82·3	56·4
Hartley	86·7	58·9	84·9	59·1
Hope Fountain	78·3	58·2	83·2	58·0
*Kariyangwe	79·7	68·5	88·3	71·7
Matopo Park	80·4	58·1	85·5	58·5
Melsetter	72·6	...	74·6	...
Mount Selinda	75·4	55·7	77·4	59·3
Plumtree ... ..	...	...	...	...
Salisbury	78·9	56·0	80·5	57·0
Shamva Mine	84·0	...	83·2	...
Sinoia	84·06	57·43	83·9	56·8
Tuli	89·5	...	93·6	...
Umtali	81·0	36·5	84·0	37·4
Victoria ... ..	...	...	...	...
Victoria Falls	80·4	57·8	...	...
York Farm, Inyanga	70·5	50·6	73·5	52·4

* Observations taken for 24 days only.

RAINFALL.

STATION.	November	December
MASHONALAND—		
Brundret (Mazoe)	2·69	4·43
Battlefields ... ..	...	...
Banket Junction	9·0	...
Borrowdale ... ..	...	...
Charter (Range)	3·41	2·63
Chilimanzi	3·60	1·45
Chininga (Lomagundi)	3·84	2·78
Chipinga ... ..	...	...
Chishawasha... ..	4·77	5·44
Chicongas Location (Old Umtali)	4·67	3·27
Driefontein	4·40	5·21
Eldorado, Railway Station	2·77	3·40
Enkeldoorn	3·47	4·15
Eagle's Nest	3·76	4·66
Gadzema, Giant Mine	6·99	2·81
Gatooma ... ..	...	2·98
Gatooma, Railway Station	8·81	3·05

RAINFALL—*continued.*

STATION.					November	December
MASHONALAND—(Continued).						
Gutu	...	...	...	...	2'50	2'29
Grassfell (Melsetter)	...	...	...	...	12'01	12'82
Hartley	...	...	...	...	10'93	1'64
Hallingbury (Hartley)	...	...	...	...	8'60	'81
Helvetia	...	...	...	...	4'94	1'77
Inyanga (B.S.A.P.)	...	...	...	...	2'28	6'43
Kanyemba	...	...	...	...	1'3	2'50
Lone Cow Estate	...	...	...	...	3'99	8'16
Makwiro	...	...	...	...	2'64	6'36
Marendella	...	...	...	...	3'21	...
Monte Cassino (Makoni)	...	...	...	...	3'18	3'84
Macheke, Railway Station	...	...	...	...	3'58	6'91
Mount Selinda	...	...	...	...	6'48	2'68
M'Rewa	...	...	...	...	3'84	5'55
Melsetter	...	...	...	...	5'35	5'48
Mazoe	...	...	...	...	4'19	4'10
M'Toko	...	...	...	...	2'37	5'86
Morgenster (Victoria)	...	...	...	...	3'22	4'34
Mount Darwin	...	...	...	...	2'64	3'54
Rusapi	...	...	...	...	4'24	5'51
Salisbury	...	...	Gaol	...	2'67	2'11
			Railway Station	...	2'55	2'10
			Public Gardens	...	2'57	...
			Laboratory	...	1'93	2'25
			West Ridge	...	2'53	2'46
Sinoia	...	...	...	...	3'23	2'95
Sipolilo	...	...	...	...	'78	...
Shamva Mine	...	...	...	...	1'44	5'11
Summer Field	...	...	...	...	3'51	7'81
Utopia	...	...	...	...	3'55	3'95
Umtali	...	...	...	...	3'47	1'50
Mutambara Mission	...	...	...	...	3'70	1'90
Umtali, Railway Station	...	...	...	...	4'45	3'60
Victoria	...	...	...	...	2'80	...
Vermont	...	...	...	...	6	3'06
MATABELELAND—						
Balla Balla	...	...	...	...	2'27	2'54
Bembezi	...	...	...	...	3'28	1'51
Bulawayo	...	...	Observatory	...	2'82	...
			Government House	...	2'92	3'44
			Railway Station	...	3'14	2'20
Belingwe	...	...	...	...	...	...
Empandeni	...	...	...	...	3'46	...
Filabusi	...	...	...	...	...	...
Fort Rixon	...	...	...	...	2'22	5'48
Gwelo	...	...	...	...	2'56	3'52
Gwanda	...	...	...	...	2'74	2'99
Gwaai	...	...	...	...	4'37	3'63
Heaney Junction	...	...	...	...	3'85	...
Hope Fountain	...	...	...	...	2'02	2'03
Inyati	...	...	...	...	2'47	3'08
Insiza	...	...	...	...	2'23	2'54

RAINFALL—*continued.*

STATION.	November	December
MATABELELAND—(Continued)		
Kariyangwe	3'09	74
Malindi	2'55	1'39
Maxim Hill	1'66	1'83
Marula	2'48	4'23
Matopo Mission	2'17	5'60
Matopo Park	49	3'98
Nyamandhlovu	2'32	1'63
Plumtree ... ..	...	...
Que Que	3'17	2'65
Ringstead Reef (Essexvale)	2'07	...
Selukwe	4'61	2'98
Shawlands	1'75	5'30
Syringa	2'70	5'49
Solusi	2'06	2'59
Tegwani	2'5	3'78
Tuli	80	67
Umguza	2'97	2'91
Umshabetsi Mission	3'11	...
Victoria Falls	5'13	3'83
West Nicholson	1'80	1'95
Wankies (Railway Station)	1'13	1'52

Agricultural Reports for November and December, 1910.

The short fall of the rains in November and in the early part of December caused some anxiety but fortunately no losses resulted, nor has it militated against the prospect of the crops except in Chilimanzi and Ndanga, where a partial drought has been felt. Harvest is at yet too distant for accurate estimate, although the total production of maize is not likely to fall short of 400,000 bags, and to be in considerable excess of the requirements of mines and towns, leaving a prospectively larger margin even than last year, to be otherwise disposed of.

Native crops in general were well got in, although in Matabeleland a good deal was twice sown, and in consequence may be late.

An unusual occurrence is reported by Mr. Wienholt from Inyanga, where, on the 18th December, a frost was experienced sufficiently severe to cut down early mealies and potatoes. Generally speaking, the rains have been peculiarly gentle and steady this year, not torrential, and have therefore been particularly favourable.

An increasing demand amongst natives for donkeys is noticeable, of which they are now beginning to hold large numbers, particularly in Matabeleland. Similarly the demand for ploughs, chiefly the old "75," continues to increase, mainly in that province.

The lack of labour is specially felt during the months of November and December, for, just when the demand is greatest during the planting season, the supply of local boys is the least. This unfavourable conjunction is likely to be permanent, and may be looked for every season, rendering indispensable the employment of Northern "boys" on farm work.

The estimated numbers of natives employed on other than mine work in Matabelend during the month of November was 12,583, and for December 12,910, while the corresponding figures for Mashonaland are 16,810 for November and 16,702 in December. No material increase from local sources is likely before February. The scarcity of labour is no doubt the main hindrance to agricultural enterprise at the present time.

Complaints of damage to native stock by lions and leopards come from Gwanda, Belingwe, Mtoko, Gutu, Chibi, Inyanga, and of depredations by wild dogs from Inyati and Makoni.

The Territory continues to be free from locusts. Complaints of damage by cut-worm to mealies have been numerous, especially where mealies are grown in a large scale and repeatedly on old lands without proper destruction of last year's stumps and stalks.

Pasturage is everywhere reported good, and the condition and health of the stock excellent, except where contagious disease has actually appeared.

Ticks, according to reports from various sources, appear to be on the increase, but the same may be said of dipping tanks to combat them for which there is a growing demand.

The Melssetter district, in spite of its being so remote, has during the past year produced a surplus of over 2,000 bushels of wheat, a quantity which could be readily increased if facilities for removal existed. On the eastern border, crops are well advanced.

Veterinary Report for November and December, 1910

SALISBURY.

AFRICAN COAST FEVER.—Fresh outbreaks occurred on the farms Parkridge, Outspan, Rainham and Homefield, all adjoining the infected farm Stamford.

All the herds were disposed of by slaughter or removal to clean veld through temperature camps.

The number of animals infected with disease was five.

In one of the temperature camps 12 animals died from vegetable poisoning.

GLANDERS.—One outbreak occurred in Salisbury. One animal showing visible symptoms was destroyed, the remainder were tested with Mallein and found healthy. The stable, fittings, etc., were thoroughly disinfected.

RHODES ESTATE, INYANGA.

AFRICAN COAST FEVER.—The disease appeared amongst some contact oxen on the estate which had been previously moved but had strayed back to infected veld. These have now been destroyed. On inspection the disease was discovered among native cattle at some kraals on the estate, these animals have been taken in hand and are being passed through temperature camps.

RUSAPI.

AFRICAN COAST FEVER.—Coast Fever was proved amongst some weaners on the farm Timaru, belonging to Rhodes Estate; these animals had been under observation for some time and have now been passed through temperature camps to clean veld.

An outbreak occurred on the farm Lesapi Valley on the Rusapi Inyanga Road. This farm had also been under the observation of the Department. One death occurred and the remainder, 195 head, were moved to clean veld.

Both of the above farms are being fenced.

Coast Fever appeared among the cattle on the farm Diana, on which a bull from Rhodes Estate had died at the commencement of the outbreak: the 13 head remaining were destroyed.

BULAWAYO.

AFRICAN COAST FEVER.—The disease broke out on Sprigvale Farm, seven have died or have been destroyed, and the rest have been passed through temperature camps to clean veld.

The balance of the cattle has been removed from the infected portion of Cophall Block No. 1 to a clean paddock.

Fencing is being erected as fast as possible.

GLANDERS.—The following animals were tested with mallein on entry:—

Horses, 123.

Mules, 301.

Donkeys, 108. Total 532.

Four animals re-acted and were destroyed.

UMTALI.

AFRICAN COAST FEVER.—The district remains free from this disease. As there was a possibility of the slaughter area having become infected by cattle from Rusapi, clean cattle were placed therein and temperatures taken but no rise was shown.

GLANDERS.—6 Donkeys and 1 Horse were tested on entry with mallein and found healthy.

LOMAGUNDI.

GLANDERS.—A mule was destroyed suffering from this disease, the in-contacts were tested with mallein, one reacted and was destroyed.

ENKELDOORN.

GLANDERS.—Two in-contacts were tested with mallein, no re-action obtained.

VICTORIA.*

RABIES.—One suspicious case of rabies reported.

MELSETTER.

Four deaths occurred on the farm Tilbury, but post-mortem and examination of blood smears did not reveal the cause of death.

Other districts, no diseases reported.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

Market Reports.

The Home Market, according to latest advice is quiet and prices somewhat lower. Maize is easier and with the large supply from the Argentine it was not expected that this article would recover for a few weeks.

The following prices for maize supplied by Messrs. Fear, Colebrook & Co., Ltd., of Southampton, are of interest. Yellow round maize, 20/- to 20/3 per 480 lbs., c.i.f. to United Kingdom, or 7/3½ to 7/5 per bag free on board South African ports. White flat maize, 7/6½ to 7/8 per bag. South African oats have been bringing 5/5 to 5/6½ per bag free on board, and River Plate oats 5/2 to 5/3½ per bag.

The local market is well supplied with all lines excepting beans and ground nuts, which are practically unobtainable at present. The new crop is not expected before June next, and in the meantime firms are importing from markets outside the territory. The market still remains dull as regards maize.

We are indebted to the following firms who have kindly supplied prices:—Messrs. Fear, Colebrook & Co., Ltd., Southampton; Messrs. Jas. Lawrence & Co., Ltd., of Kimberley and Johannesburg; Messrs. Wightman & Co., Ltd., and Messrs. Whitfield & Co., of Salisbury.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	13/0 14/0	9/6 12/6	—	—
Beans, per 200 lbs. ...	18/6 28/6	—	—	32/6
Beans, Sugar ...	—	26/6 30/6	—	—
Beans, kafir, per 203 lbs. ...	—	25/0 27/6	22/6 25/0	—
Boer Meal, unsifted ...	—	23/6 25/6	—	—
Boer Meal, sifted, per 200 lbs. ...	18/3 22/6	26/0 28/6	37/6 44/0	45/0 47/6
Bran, per 100 lbs. ...	6/0 6/6	6/0 6/3	14/6 15/6	17/0 18/0
Flour ...	—	15/6 16/6	—	21/0 24/0
Flour, Colonial 100 lbs. ...	—	15/6 16/6	26/6 23/0	—
Forage, T'vaal, 100 lbs. ...	3/6 5/9	—	—	—
" O.R.C. " ...	3/9 4/6	—	—	—
" Colonial " ...	—	5/0 5/6	—	—
" Oat ...	—	—	8/0 10/0	10/0

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Hay, per bale ...	1.4 2.0	—	—	—
Kaffir Corn, White, per 200 lbs. ...	8.0 8.9	9/6 14/6	8.0 8/6	—
do. Mixed 200 lbs. ...	8.9 9.11	10/6 12/6	—	—
Manna, per 100 lbs. ...	—	—	—	—
Mealies, S.A., White per 200 lbs. ...	6.6 7.0	8.0 8/6	10/3 11/6	7/6
Mealies, S.A., Yellow, per 200 lbs. ...	7.6 8.0	8/6 9/0	10/6 11/0	—
Mealie Meal, White, per 200 lbs. ...	—	8.6 9/3	—	—
Manga, per 200 lbs. ...	—	—	—	12.0
Monkey Nuts, per lb. ...	—	—	3½d. 4d.	3d.
Oats, per 150 lbs. ...	9.4 11.0	9/9 10/3	21/6 22.3	25.0
Onions, per 120 lbs. ...	6.9 19.0	13/6 16/0	18.6 20/0	17/6
Peas, per 200 lbs. ...	16.9 18.6	—	—	—
Potatoes, per 150 lbs. ...	2.6 10.6	—	20.0 23/0	17/6 20/0
„ O.R.C. ...	—	10.0 15/0	—	—
„ New ...	—	10.0 20.0	—	—
Rapoko ...	—	—	—	11/0
Rye, per 200 lbs. ...	10.0 11.0	—	—	—
Salt, per 200 lbs. ...	4.0 4/3	3.0 4/0	9/0 9/6	—
Tobacco, good, per lb ...	—	4d. 7d.	—	—
„ inferior, per lb ...	—	1d. 2d.	—	—
Wheat, per bag 203 lbs. ...	—	20.0 21/6	—	30.0
Butter, per lb. ...	9d. 1/3	1/1 1/3	6d. 1/6	1/6 2/0
Butter, second quality ...	—	11d. 1/0	—	—
Eggs, per doz. ...	10d. 1/4	1/0 1/9	2/6 3/0	3.0 3/6
Ducks, each ...	2/0 3/3	2/9 3/3	4/6 5/6	4/6
Fowls, each ...	1/6 4/0	1/6 2/3	1/9 2/10	4/6
Geese, each ...	3/6 6/3	6/0 10/0	—	12/6
Turkeys, each ...	5/0 30/0	—	20/0 25/0	17/6 £1
Oranges, per 100 ...	—	3/0 8/6	12.0 14/0	—

LIVESTOCK.

Horses ...	—	£10 £25	£15 £20	£25 £30
„ Mares ...	—	—	£17/10	—
Mules ...	—	£20 £22/10	£27/10 £32/10	£30
Donkeys, geldings ...	—	£4/10 £7	£6 £8/10	—
„ mares ...	—	£5 £7/10	£7 £8	—
Cows, Dairy ...	—	—	£25 £30	£25 £30
Cows, Native ...	—	—	£8/10	£10
Heifers, Colonial ...	—	—	—	—
Heifers, Native ...	—	—	—	—
Oxen, Trained ...	—	£7 £8	£10 10	£10
Oxen, Ordinary ...	—	—	—	—
Cows, Slaughter ...	—	£7/10 £9	—	—
Oxen, good ...	£9 £19	£10/10 £13/10	—	—
Oxen, medium ...	—	£8/10 £9/10	—	—
Calves, ...	—	£2 £3/10	—	—
Sheep, ...	12/6 22/6	14/0 17/0	25/0 25/6	£1
Lambs, 30 lbs. ...	—	8/0 10/0	—	—
Hamels ...	—	14/0 17/0	—	—
Kapaters ...	—	14/0 18/0	—	—
Pigs, clean, per lb. ...	—	3d. 3¼d.	—	4d.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draft; Feeding and kraaling of live stock; Hints on the principles of cattle breeding.

Chemistry.—The principles of soil fertility; The principles of manuring; The value of lime in agriculture; Chemistry of milk and its products (accompanied by demonstrations in milk testing.)

Entomology.—Economic entomology on the farm; The role of insects and their allies in the transmission of disease; Scale insects and fruit trees and methods for their control; Insect pests and maize; Enemies of the potato, insect and fungus; The value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation ; The measurement of water in connection with irrigation ; Canal irrigation ; Storage reservoirs ; Hints on the selection of sites and on the design of earthen and other dams ; Irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

CO-OPERATIVE EXPERIMENTS.

Distribution of Winter Cereals.

The undermentioned winter cereal seeds will be available for free distribution, free on rail Salisbury, under the usual terms of Co-operative Experiments, during the months of March, April and May.

Not more than four or five kinds can be issued to each applicant, and the weight of the seed of each kind will be from 15 to 20 lbs. The successful results which have already been obtained with winter cereals when sown on naturally moist soil without irrigation, justify the hope that any of those below mentioned are likely to prove satisfactory and are certainly well worth trial under such conditions.

Those marked with an asterisk are thought to be specially suited to non-irrigated land.

WHEAT.

Bobs.

Klein koren.

Du Toit's koren.

*Early Gluyas.—Very early.

*Golden Ball.

*Medeah.

OATS.

Algerian.

*New Zealand. (A late kind, giving a stout feeding oat.)

*White Tatarian.

*Sidonian.

BARLEY.

*Nepal barley wheat.

*Chevalier malting barley.

RYE.

*Early Rye.

*Mammoth late winter. Under certain conditions, this variety if sown early, can be fed off by stock in mid-winter and allowed to run into ear in early spring.

Applications should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, and should be accompanied by full particulars as to the method of forwarding which is desired.

In the case of consignments to be sent by Parcel Post or addressed to a siding, on which charges must be prepaid the applicant should enclose cheque or post office order to defray such expenses.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together

with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficiently general interest.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

TOBACCO SEED.

All enquiries for tobacco seed should be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DESTRUCTION OF WILD CARNIVORA, ETC.

The undermentioned rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£3 0 0
„ Leopard	£1 0 0
„ Cheetah	£1 0 0
„ Wild Dog	£0 10 0
„ Crocodile, of not less than 3ft. in length	£0 10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may purchase pure bred stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges in selecting the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year, a deposit being made, in the first instance one third of the purchase price on delivery, one third after six months, and the balance a year after purchase. The Government meets risks on rail and until delivery is effected.

Recent purchases include 25 bulls and 75 heifers, comprising Shorthorn, Friesland, Devon, Jersey and Afrikaner breeds; 180 Persian sheep, and a small number of pigs. Applications for high-class stud stock only will be entertained.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Board, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an officer deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars, together with plans and specifications, can be obtained.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice. All applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

- The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
Winter Feeding of Farm Stock, by H. Godfrey Mundy, F.L.S.
Ensilage, by H. Godfrey Mundy, F.L.S.
The Conservation of Kraal Manure, by H. Godfrey, Mundy, F.L.S.
The Preservation of Butter.
Rhodesian Standard Types of Maize and their points, by H. Godfrey Mundy, F.L.S.
Requirements in sending Botanical Specimens to the Department for Identification.
The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc.
Agricultural Co-operation in Rhodesia, by P. J. Hannon.
Special Railway Rates for Benefit of Farming Community.
Plans and Specifications of Flue Curing Barns.
Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
Hints on Irrigation—Small Gravitation Schemes—by W. Martin Watt, Government Agricultural Engineer.
Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., Government Agricultural Chemist.

CROPS.

- How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
Cotton Cultivation, by J. L. Stinton.
The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
Maize Growing, by H. Godfrey Mundy, F.L.S.
Onion Growing, by H. Godfrey Mundy, F.L.S.
Tobacco, by G. M. Odum.
Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S.
Notes on Tobacco Culture:
 Bulletin No. 5;
 Bulletin No. 7.
Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

Onion Thrips, by R. W. Jack, F.E.S.

"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

The Tsetse Fly, by L. E. W. Bevan, M.R.C.V.S.

Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.

The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.

The Head Smut of Maize, by H. Godfrey Mundy, F.E.S.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.

Black Orange Aphis, by Rupert W. Jack, F.E.S.

Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.

Regulations affecting the Importation of Potatoes, by Rupert W. Jack, F.E.S.

Selection of Spraying Outfit, by R. W. Jack, F.E.S.

Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.

VETERINARY.

Cots in Equines, by R. Ferguson Stirling, M.R.C.V.S.

Wireworm, or Hairworm, in Melsetter District, by E. M. Jarvis, M.R.C.V.S.

Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.

Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S., and M. F. McGregor.

African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition).

Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.

Strangles, by F. D. Ferguson, M.R.C.V.S.

Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

The Construction of Dipping Tanks for Cattle.

Animals Diseases Consolidated Ordinance, 1904.

Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture. of Products, Soils, Water, etc.

How to make use of the Fencing Ordinance, 1904, by N. H. Chataway.

Loans for Fencing.

The Time and How to Find it, by Rev. Father Goetz, S.J.

Malaria, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).

Rural Education in Rhodesia, by G. Duthie, M.A., B.A., F.R.S.E.

Game Law: Summary of.

Government Notices.

No 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingwilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection

with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of

Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sowerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about $2\frac{1}{4}$ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

1.
residing at
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to * Station

will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....
Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOV- ERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.]

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date

Application

Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....

Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be
 true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals
 Diseases Consolidation Ordinance, 1904," I do hereby cancel and
 repeal Government Notice No. 124 of 1908, and do hereby declare and
 make known that, notwithstanding anything to the contrary elsewhere
 provided, the importation of cattle for bona fide slaughter purposes may
 be permitted into the Umtali district from the adjoining Portuguese ter-
 ritory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of
 these regulations, shall be under the absolute control and direc-

- tion of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be de-trucked at the slaughter enclosure and immediately confined therein.
 - (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
 - (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
 - (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
 - (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
 - (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Heritage Preservation Act 1859, and upon conviction to a fine not

exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two

miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any

second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the pro-

visions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. **O**N and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lung-sickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours:	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls "	0	5	0
d. " donkeys "	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable

time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of, Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue

of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass
Hay
Forage
Sugar Cane

Straw
Lucerne Hay
Green Lucerne

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODERIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

I. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which, is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by
 - [1] A certificate by a Government Veterinary Surgeon of the territory of origin that
 - a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
 - [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.

Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....

Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature.....
Government Veterinary Surgeon.

CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....
.....Cows and heifers,
.....Calves,
.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....
Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazeley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to

import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.
cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 229 of 1910]

AFRICAN COAST FEVER.

[17th August, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

[18th August, 1910.

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.]

SOUTHERN BOUNDARY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaguabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 240 of 1910.]

[1st September, 1910.]

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
 The Oleander Scale (*C. hederac*)
 The Circular Purple Scale (*C. aonidum*)
 Ross's Black Scale (*C. rossi*)
 The Purple or Mussel Scale (*Lepidosaphes beckii*)
 The Long Scale (*L. gloverii*)
 The White Peach Scale (*Aulacaspis pentagona*)
 Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 329 of 1910.]

[15th December, 1910.]

AFRICAN COAST FEVER.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

I, Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof.

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as, may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;
- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9. From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farms jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railway line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with

mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle--

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road,

public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....
Bulls.....
Oxen.....
Young Stock.....
Calves.....
Cause of decrease.....
Cause of increase.....
Name of farm.....

(Owner's Signature.)

No. 14 of 1911.]

[12th January, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 168, 281 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

1. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

(b) The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—
Bitton, Syston.

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

- (d) The native district of Inyanga.
- (e) The native district of Makoni.
- (f) The native district of Umzingwani.
- (g) The following farms in the native district of Insiza :—

Centrebank,	York,	Kildare,	Lincoln,
Woodhouse,	Kogha,	Eldorado,	Bonnybrook,
Fairview,	Outspan No. 3,	Lancaster,	Blagdon,
Idutwa.			

2. The following area is defined for the purposes of section 17 of the said Notice, viz. :—That portion of the native district of Goromonzi lying west of and including the following farms :—

Borrowdale, Springs, Stuhm, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruua River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information :—

“ 16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

“ 17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule “A” being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following :—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imleza Plots.

Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.



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Editorial.

PRECAUTIONS AGAINST AFRICAN COAST FEVER.—The Animals' Diseases Amending Ordinance, 1911, considered and passed at a session of the Legislative Council specially summoned for that purpose, is dealt with at length elsewhere and the full text of the new law will be found under the head of Government Notices.

A kindred matter, the sub-division of the whole Territory into areas within which, under permit, ox transport may be conducted, has simultaneously been arranged to take effect as far as possible from the 1st April. Three months notice of the adoption of this new system has been given and in most cases, those interested in the particular requirements of each portion of the country have made application, so that virtually the whole country has now been sub-divided into areas, each with access to a railway station or to other convenient centre. In several instances interests clashed, and in some the areas asked for overlapped, and in others they did not quite meet. Adjustment has therefore been necessary, and no doubt as time goes on modifications of boundaries will be called for as economic conditions alter.

It should be clearly understood that within these areas, ox transport is only permissible under permit from Cattle Inspectors and the acquiescence of the owners of the farms crossed. No uncontrolled movement is allowed. Further, these limits only apply to ox transport; cattle may be moved for other purposes from one part of the country to another as hitherto under the regulations generally known.

MOVEMENT OF STOCK.—Attention of all persons interested in this important matter is again directed to regulations published under Government Notice 329 of 1910, which does not deal only with ox transport areas and which comes into force on the 1st April. Ox waggon employed on roads must bear the owner's name and address in legible characters on the right side. All working cattle must be distinctly branded with the registered brand of the owner before they can be allowed to be moved.

Permits obtainable from Cattle Inspectors are necessary for all movements beyond the limits of the farm. Any deaths of stock occurring in the vicinity of an infected area must be immediately reported to the authorities. Not least important is the regulation prohibiting cattle being on roads, outspans or commonages, unless they are free from ticks, or unless they have been dipped or sprayed within fourteen days. The onus of having his cattle clean is thus placed upon the owner.

As the Committee of Enquiry into African Coast Fever pointed out such restriction may occasion inconvenience in certain instances, but they are generally recognised as being framed in the best interests of the owners of stock and of the whole industrial and farming community.

PROPOSED WATER ORDINANCE.—The attention of farmers is very particularly called to the draft of a new Ordinance to be brought up at the forthcoming Legislative Council to deal with the ownership and use of water and the promotion of irrigation. As published, the bill consists of sixty-seven clauses and is divided into six chapters dealing with the ownership and use of public and private water, water boards, servitudes, powers conferred on the Administration, the change of the course of streams, existing rights, and offences and penalties.

The law has been based on similar legislation in other countries, more particularly on the recently framed irrigation law of Swaziland, where in many respects the conditions are akin to those of Rhodesia, more so than to the Transvaal or Cape Colony. It is interesting to note that legislation is at present under consideration bringing into line the water laws of the various provinces of the Union of South Africa. It is to be noted also that when this Ordinance comes into force, the vexed question of "Inner Bank Titles" will also be solved; rivers becoming legally recognised as public property available for the joint use of all those who are in a position to turn to advantage any opportunities nature offers. The passage of such an Ordinance should be a great stimulus to the application of the methods of irrigation to farming in Rhodesia.

POWER MAIZE SHELLERS.—Last season, Mr. Pretorius, of Salisbury, imported and used on his farms a power maize sheller with satisfactory results. Profiting by the example, and realising the rapidly altering economic conditions of the country and the shortage of labour with which they are faced, a number of farmers in the principal maize growing areas have arranged to import maize shellers, either jointly or as independent ventures, for use in the approaching harvest. Some six or eight such outfits, most of them by that well known firm Messrs. Ransomes, Sims and Jeffries, of Ipswich, are expected, and several will be available for hire, the prospective charge varying from 3d. to 4d. per bag, according to circumstances. Competition will no doubt reduce charges to a uniform level, and the low cost of hand labour must always act as a check on the cost. Against this must be set the convenience of having the work, which at present occupies months dismissed in a few days. If land can be cleared to allow of autumn ploughing, one of the principal means of suppressing cut-worm and the maize stalk borer will have been attained, and a great gain secured in enabling the land to be twice ploughed before the succeeding crop. These machines, moreover, husk, shell and winnow the maize, and the grain, therefore, should be more free from cob and thrash than hitherto, and more even in size of berry, facilitating the production of large consignments of uniform grade, whether for export or local sale.

The following are mentioned as prospective owners of power shelling outfits:—In the Salisbury District: Mr. Tom Pretorius; Mr. Black, Stapleford; Mr. Laidlaw, Kinvarra; and M. Spence; in Mazoe: Mr. Garvin, Sleamish, and Mr. Charles Southey on Moor's Concession. In some instances these machines have attachments for shredding the whole maize plant, thus converting it into a convenient form for storage and winter feed for stock.

FENCING AND BEACONS—In connection with the increasing activity in fencing operations, it has been brought to our notice that fencers, owners or contractors, apparently in their keen anxiety for precision, have occasionally perpetrated the serious offence of bodily removing their own and their neighbours' landmarks for the purpose of planting their straining posts exactly where the beacon was. No doubt this is done in all innocence and in ignorance of the gravity of the offence. The sanctity of landmarks have been recognised since the earliest times and is supported by scriptural authority. Moreover the penalties attached and the expense of re-surveying farms far more than counterbalances the cost of an extra straining pillar or two, and the loss of a few square feet of ground round the beacon. Farmers interested in the subject are recommended to erect straining posts on the line of their boundary a few feet away from the beacon. Where three properties meet, a small triangle would be created and the wires connecting the three terminals now necessary would create a small enclosure round the beacon, thus further safeguarding in place of destroying it; similarly when four or more farms meet at one beacon, a small polygon is enclosed the amount of land taken from each being a mere trifle.

INOCULATION OF MULES.—It has been decided to reduce the charges for inoculation of mules against horsesickness from 25s. to 15s. per head. This step has been rendered possible by a recent reduction in cost of the serum used, the object of the fee being merely to cover the actual expenses. Buyers of inoculated mules should note this fact, as any lessening of the present high prices of mules should be welcome and should benefit the ultimate purchaser rather than the middleman.

THE AGRICULTURAL SHOWS.—We have received the prize list of the tenth Annual Agricultural Show to be held at Umtali on June 15th and 16th. Ample opportunities are given by the Society for every class of stock and produce found in Rhodesia to be exhibited, with the regrettable exception of the chief item of all—cattle, which it is not yet deemed expedient to bring together on such an occasion. While moving for protective duties against maize grown in Portuguese East Africa, the Umtali farmers yet show a sporting spirit in throwing open to Mozambique as well as to all Rhodesia the sections for produce, including tobacco, mealies, meal, beans, potatoes, coffee, rubber, timber, cassava, rice and monkey nuts. Not only so, but a gold medal is specially offered to the most successful exhibitor of produce from the Mozambique Company's Territory. At the time of writing, there is considerable uncertainty as to whether it will be possible to hold shows at Bulawayo and Salisbury.

COLLECTION OF AGRICULTURAL PRODUCTS.—The Department of Agriculture has gathered together a collection of agricultural produce and commodities and articles of interest to farmers, possessing some instructive value as shewing what can be and what is being grown in Rhodesia. Recently this collection was placed in the Victoria Memorial, Salisbury, in a hall kindly set apart for the purpose by the governing body. Inspection of these specimens is invited and is free, and at the same time it may be mentioned that any contributions of a similar nature, grains, manufactured articles of actual or potential importance will be much welcomed. Things which may seem to some common and ordinary will no doubt be suggestive and interesting to persons from other parts of the country, and especially to new or prospective settlers, and to those who come up to spy out the land. To all such every opportunity of seeing what Rhodesia has to offer must be given, for what the farming industry still needs is more farmers, and the more the better for those already established. Samples may be addressed to the Director, Department of Agriculture, Salisbury, and all such gifts will be warmly appreciated.

FARMERS' ASSOCIATIONS.—Yet another association is announced, that of Lalapansi in the Gwelo District, with Mr.

Trollip as president, and Mr. D. G. Bradford as secretary, and an initial membership of twenty-seven. This part of the country is rapidly coming to the front, and the foundation of an association to voice the views of the farming community, and to promote the discussion of agriculture and pastoral topics, and the interchange of ideas amongst its members is a welcome sign of progress.

Through the courtesy of the various secretaries of Farmers' Associations, we are enabled to give a nearly complete list of dates of meetings, but should be glad to receive those still unfurnished, and any corrections that may from time to time become necessary.

VERMIN.—We call attention to a notice on another page regarding the rewards given for the destruction of wild carnivora. For lions the reward is raised from £3 to £7 10s., whilst hyenas and baboons have been added to the list at 10s. and 2s. 6d. each respectively.

The proposal to dispense with the surrender of the skin in certain cases has been considered but not found feasible.

TO ADVERTISERS.—Advertisements intended for the *Rhodesian Agricultural Journal* should be sent either direct to the Editor, Department of Agriculture, Salisbury, or to any of the following authorised agents :—

Messrs. Anstead & Co., Salisbury.

Central News Agency, Capetown.

S.A. Advertising Contractors, Capetown.

Rhodesia and S.A. Mining, Land and Estate Agency,
Johannesburg.

Rockwell Advertising Company, Johannesburg.

Mr. E. F. Sheppy, c/o *Empire Gazette*, 11, Haymarket,
London.

Particulars regarding rates may be obtained from any of the above.

The Animals' Diseases Amending Ordinance, 1911.

A special session of the Legislative Council was summoned to consider legislation necessary to amend the existing Animals' Diseases Consolidation Ordinance of 1904. The Council met during February, and the outcome is a measure calculated to do much to facilitate the suppression of outbreaks of contagious diseases in general, particularly of African coast fever.

Steps to this end have been much under consideration of late by all interested in agriculture and cattle rearing, and in transport, and many widely differing remedies have been proposed. The Committee of Enquiry, which recently took evidence throughout Rhodesia and certainly obtained the views of the country at large on the subject, presented a report which in great measure formed the basis of the ordinance as submitted to the Legislative Council. In Committee, certain clauses were amended mainly strengthening the measure, while one or two proposals, to which reference will be made later, were entirely altered or deleted. The subject has been well ventilated in the press and elsewhere, but it may serve a useful purpose here, without discussing the merits or demerits of the new law, briefly to indicate the nature of its provisions and to explain what is entailed thereby.

A fundamental principle of this Ordinance is the recognition of the value of fencing as a remedial measure against coast fever. The methods of dealing with coast fever, now adopted and recognised as effective, consist in a series of well defined steps varying only according to circumstances, just as the treatment of any specific disease in the human subject, while generally known, has yet to be modified and directed by the physician according to the idiosyncrasies of each particular case.

The first step, no cure being known, is the destruction of all affected animals, if possible, at a stage before they are

capable of becoming infective. The unit to be treated is the herd, not the individual. The herd then is moved as quickly as possible on to clean veld and passed through a temperature camp. This implies that daily the temperatures of each animal are taken and all those shewing by elevation of temperature and other symptoms that they are attacked by the disease are moved back and destroyed before they can become a danger, while the rest pass out on to clean veld, having escaped contagion. Occasionally this process of passing the temperature camps has to be repeated before a herd can finally be regarded as clean. Where there is no infected veld available for such purposes, there is no choice but to destroy the whole herd in order to prevent the possibility of further spread, and to hasten the time when the veld and neighbourhood can be again declared clean. This severe measure is only resorted to where it is regarded as the mere acceleration of the natural process of extermination, and in such cases compensation to the extent of one-half the assessed value has been awarded, although as an act of grace and without establishing a precedent, as for this step no legal provision exists. When by either process the infected veld has been denuded of stock, it is left for a period sufficiently long for all infective ticks to die. Stock other than cattle may graze over the land with impunity, with advantage indeed, as they render innocuous any infective ticks which may engorge themselves upon them. The presence of other stock can, however, in no way shorten the period of quarantine of the veld as it can never be assumed that every tick has so cleansed itself. This time alone can secure. Eventually after the lapse of from fifteen to eighteen months the area is tested by the introduction of a number of susceptible cattle which are grazed over veld known to have been previously infected. Temperatures are taken regularly, and should, as has in a few instances occurred, the disease manifest itself, then the test animals must be removed through temperature camps and all cattle be excluded for a further period, repeating in fact the whole process. It is expedient therefore not to be hasty in applying the last step of the process—that of testing, as in the event of the manifestation of the disease so much time has again to elapse before the area can be safely declared clean. Experience and results obtained justify this policy. Coast Fever appears, but the

outbreaks are suppressed. For the application of these measures it will be readily seen that the erection of fences round infected veld is of the utmost use.

The main features of the measure, besides fencing within infected areas by the Government on behalf of the owners, consists in similar provisions with respect to the erection of dipping tanks, powers given to Magistrates of their discretion to confiscate cattle unlawfully moved, and minor amendments of the existing law.

After the usual preliminaries repealing any contrary previous legislation, the Administrator is given power in Clause 2 to declare as actually infected for the purposes of the Ordinance areas within which any destructive disease is known or suspected to exist. The diseases declared under the main Ordinance to be destructive, several of which are, however, unknown in Rhodesia, include African Coast Fever, Anthrax, Foot and Mouth Disease, Glanders and Farcy, Heartwater, Lungsickness, Mange, Pyaemia, Redwater, Rinderpest, Swine Erysipelas, Swine Fever, Symptomatic Anthrax, Tuberculosis, Scab in sheep and goats, Rabies, Liver Rot and Liver Fluke in small stock, and Trypanosomiasis. Areas round suspected or known centres may similarly be proclaimed, also areas round towns and clean areas near, though not necessarily adjoining, infected areas if such a course appears expedient (Clauses 2 and 13).

Within such proclaimed areas the Administrator may cause fences to be erected round or across farms for the purpose of combatting disease (Clause 3). It is not intended that all farms within these areas shall be ring fenced, only where necessary. The proprietor may erect the fences himself, or the work may be done through contractors, or by the Public Works Department direct. Usually such fencing has to be erected as rapidly as possible and sometimes one sometimes another method is the more expeditious. For this reason the phrase used is that "the Administrator may cause fences to be erected."

The proprietors may pay for the fence immediately or subsequently, but provision is made for the cost being defrayed out of public funds in the first instance (Clause 4). Repayment is extended over seventeen years, The first contribution

is not called for until two years after the erection of the fence, and may be made in fifteen equal annual instalments, interest on the capital amount being charged at the rate of 5% per annum.

The cost of fences on the boundaries of farms is to be met in equal shares by the joint owners. The Government meets this half cost in the case of native reserves. As indicated in the Administrator's speech, the British South Africa Company has undertaken for a period of five years to meet from its private funds its share of the cost of fencing unalienated lands included within proclaimed areas. Occasionally it may be found desirable, as for instance where but a portion of a farm is infected and the rest known to be clean, to carry cordon fences across a farm. In such cases the Government meets the entire cost of the fence and retains the right to remove the same unless the owner of the farm wishes to take it over at its cost price. The term "owner" as used in the Ordinance is specially defined to mean (a) persons registered as such in the office of the Registrar of Deeds (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

The difficulties of farmers whose land is bounded by rivers are specially provided for in Clause 5. Unless an agreement is come to between the owners as to the partition of the dividing fence within a reasonable period, the fence is to be erected without reference to them.

As considerable sums of money are being laid out in fencing, recoverable over a long period of years, provision for security is made in Clause 6. Owners are required to furnish adequate security for repayment, failing which, by a simple method of procedure, the amount due is recorded by the Registrar of Deeds, as a hypothecation of the land, ranking from the date such entry was made. This course should however, only exceptionally, be necessary.

A certain amount of land in Rhodesia is occupied by tenants paying rent, or even more frequently, as in the case of settlers on permit of occupation terms, by persons in process of purchasing the land by the payment of annual instalments. In such cases, the tenant is called upon to pay interest at the rate of 5 per centum on so much of the value of the fence

as the proprietor is liable for, and this payment is regarded as an addition to and part of the rent. On the purchase of the farm in such cases, any unpaid balance for cordon fences, shall, as it becomes due, be paid on the lines indicated above by the new owner of the land.

Clause 9 is inserted to meet the peculiar case of certain commonages where provision exists for the contingency of the sale of such land at any future date.

As regards the repairs of fences, the existing law is made to apply (Clause 10).

The erection of gates and penalties for not closing them are secured (Clauses 11 and 12).

In dealing with recent outbreaks, the methods detailed above have been applied and fences erected by the Government for nearly 300 miles in length. In numerous instances, the farmers concerned have agreed to take over such fences very much on the lines laid down in the Ordinance. Others, however, have not agreed to do so, and a few have refused. In order that all might be treated alike in this matter, the Ordinance has, in Clause 14, been made retrospective, thus bringing under its operation the fences erected in connection with the outbreaks which have been dealt with at Marandellas, on the Salisbury Commonage, at the centres Gletwyn, Bitton, Stamford, and the Essexvale area.

The efficacy of dipping as a means of destroying ticks, the conveyors of many other diseases besides coast fever, is recognised, and in Clause 15, the same principle applied to fencing is adopted for the construction, within proclaimed areas, of dipping tanks, in the first instance at the public expense, but recoverable from the farmer on the same easy terms of payment as in the case of fences. Originally it was suggested that in the case of dipping tanks, half the cost should be born by the owner and half by the Government, but in deference to the views of the elected Members this was altered to the system indicated above.

It is generally recognised that the chief danger of spread of stock disease lies in the illicit movement of cattle. Such movement is, under present conditions, more difficult of detection than of accomplishment, and public opinion has favoured the imposition of severer penalties than have been

the rule hitherto, as a deterrent to such traffic. To this end the African Coast Fever Committee of Enquiry recommended in addition to the existing law empowering the destruction of infected animals, that provision should be made for confiscating cattle moved in defiance of the law in cases where destruction is not considered necessary.

On this point the African Coast Fever Committee reported as follows :—

“We are of opinion that the punishments awarded for breaches of the cattle laws and regulations are often entirely inadequate. Cases have been brought to our notice where the law has been broken deliberately, the profit to be gained thereby far exceeding any punishment to be feared. The majority of the Committee favour the assigning of a minimum penalty for offences under the “Animals Diseases Ordinance and Regulations,” although it may be a matter of doubtful expediency, and, in cases, calculated to defeat the end in view. At present cattle illicitly moved may be destroyed if considered a source of danger. We think that provision should be made for confiscating cattle moved in defiance of the law in cases where destruction is not considered necessary.”

As originally drafted, and in accordance with these views, confiscation was imposed in addition to the penalties already provided. After discussion this has been modified, and the Magistrate or Judge may order confiscation or not in addition to the ordinary penalties.

Clauses 17, 18 and 19 deal with amendments to the main Ordinance found by experience to be desirable, referring to the imposition of quarantine measures, the duties of cattle inspectors, and imposing upon receivers of cattle responsibility for ascertaining that they are duly accompanied by proper permits for movement.

Originally a series of clauses in conformity with the recommendations of the African Coast Fever Committee of Enquiry were drafted providing that persons dealing in cattle should be registered and take out licences in order to facilitate control over movements. This, however, was deleted in discussion.

The full text of the Ordinance will be found printed at the end of this number under “Government Notices.”

The Detection and Prevention of the Diseases of Stock in Rhodesia.

By L. E. W. BEVAN, M.R.C.V.S.

In Rhodesia where diseases so often run a rapid course, and where epidemics, insidious at first, quickly assume alarming proportions, it is of the greatest importance that every stock owner should learn to detect, and, as far as possible, to arrest disease at its onset.

To do this he must recognise that the border-line between health and disease is often so ill-defined that it is only by becoming intimately acquainted with the habits and appearance of his stock at all times that he can hope to detect any transition from normal to abnormal. He must therefore train his powers of observation by a regular and systematic examination of his animals, commencing with the herd or flock as a whole and narrowing down to the individual.

Such an EXAMINATION OF A NUMBER of animals must necessarily be tedious and incomplete at first, but with practice and system it will become easy, rapid and exact, and, in time, will be performed almost sub-consciously. The careful stock owner will cast his eye over his animals early in the morning before they leave the stable or kraal, for it often happens that sick animals look their worst after the cold or discomforts of the night when they have been for some time without food or water. When they are turned out to graze and as they return at night, he will closely watch them, paying particular attention to those that come last, for it is generally among the stragglers that those which are sick are to be found.

WHEN AT PASTURE his attention will be quickly attracted by any one of the following indications. His eye will be drawn to the animal which remains apart from the rest, is continually lying down when the others are standing or vice-versa, assumes an unusual attitude, lags behind when the troop is moving, walks lame or with an unsteady gait, does not feed when the others are grazing, has a morbid or depraved appetite

or unusual thirst, appears dull, nervous, vicious or restless, has a dry or 'staring' coat, or appears thinner, weaker or less thrifty than the rest of the herd.

Among draught animals he will note any unusual sluggishness, dulness, weakness, excessive sweating, difficulty in breathing or irregularity in the manner in which the work is performed.

Any of the above indications are the 'danger signals' of disease and should be followed by an examination of the suspected animal at CLOSE QUARTERS. The observer should not approach so hastily as to alarm or disturb the animal, but should quietly and unostentatiously make his way up to it, carefully watching for any signs which may be afforded by it in its natural condition. Much information may also be obtained from the stable door. At this time some special attention should be given to the behaviour, attitude and appearance, the carriage of the head and ears, facial expression, general condition, state of the coat, character of breathing, whether ruminating,—in the case of cattle and sheep—manner of voiding excreta, character of faeces and urine, and the presence of unusual discharges from mouth, nose or eyes.

Next the animal should be approached and secured as quietly as possible and a careful and MINUTE EXAMINATION should be made in a thorough and systematic manner.

While it is generally possible to manipulate horses, mules and cattle are more difficult to handle and may need some method of restraint. Mules are more often easy to manage in bridles with blinkers than with simple head-stalls. For such purposes a CRUSH-PEN is in this country almost a necessity on every farm. This consists of an enclosure made of stout smooth wood, having two sides about eight feet long, four and a half feet high, about two and a half feet apart, running parallel with each other. The sides may be closer together at the ground and, indeed, need be only two feet apart at the top, but the above measurement may be found convenient as long horned cattle can enter without discomfort. At each end slip-rails are placed at right angles to the sides and at a distance of two, three and four feet from the ground. The box-like enclosure thus formed is approached by two converging sides forming a V shaped 'race.' This structure may with advantage be situated at the

exit of the kraal and the cattle may pass through it regularly, in this way becoming accustomed to it. When necessary, the front cross-bars having been inserted, the animal is run in as usual and the hind bars quickly pushed across behind it so that it is held prisoner in the 'pen.' If the crush is constructed wider than 2ft. 6ins. there is a danger of the animal trying to turn and thus injuring itself, but in dealing with a large number of animals, as for example when taking temperatures in outbreaks of African Coast Fever, Cattle Inspectors have lately erected crushes about eight feet square which will hold four or five full-sized oxen at a time.

The uses of a crush-pen are unlimited ; animals secured in it can be handled quietly and quickly, they can be sprayed or hand dressed, medicines can be given to them, operations may be performed upon them, they may be minutely examined and their temperatures can be taken with impunity by the operator. In dealing with epidemics, where a number of animals have to be handled, a crush-pen is almost an essential, and it behoves every farmer to erect one, not only to enable him to handle his stock at all times but to facilitate the immediate and minute examination of his animals when contagious disease has broken out amongst them. The failure to take this simple precaution has frequently resulted in considerable loss of valuable time in which preventive measures might have been put into operation. Various forms of crushes are shown in the illustrations.

It is to be remembered that in order to arrive at a correct idea as to the state of an animal under examination, one must try to avoid giving rise to an unnatural condition by chasing and rough-handling, thereby causing excitement or nervousness. While gaining the confidence of the patient by handling, patting and stroking, note should be taken of the *external body temperature*, as indicated by the relative heat of the general surface and extremities (ears, horns, nose, legs and feet). In a state of health these present a uniform sense of warmth, but in disease are liable to considerable variations in temperature. In this way information may be gained as to the state of the heart and its power to drive blood through the system. The extremities being the first to suffer from any loss of power (*vis a tergo*) are proportionately colder than the parts nearer the heart. In some cases it may be noted that the extremities are "deathly cold" while the body is

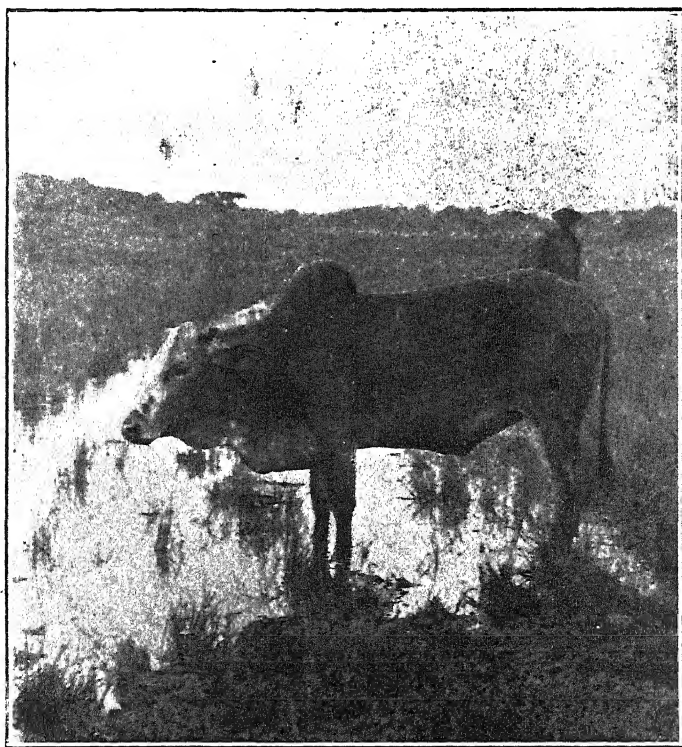
bathed in a cold sweat, a condition which often indicates heart failure and on-coming death. In fever and in some nervous conditions the surface temperature may be elevated, while in anaemia, collapse, and some wasting diseases, it may be reduced.

The usual indications of inflammation are heat, pain, redness and swelling, but in veterinary patients it frequently happens that the increased heat of the affected area is the only appreciable symptom. These localised areas of increased temperature are of great value in diagnosis. Thus lameness due to an injury of the foot, sprain of a tendon or joint may sometimes be detected by the unusual heat in these parts; such estimation being based upon a comparative examination of suspected parts with others considered to be normal. Differences in external body temperature are sometimes so slight as to be almost inappreciable when using the palm of the hand; it is often advisable to apply the back of the hand where the skin is less coarse. And it must be remembered that warmth is often imparted by excessive handling. Some specific diseases are associated with increased heat of the parts involved, as for example, fever of the feet (laminitis) rheumatism, etc.

At this stage it may be well to remark the *condition of the skin* and the coat of the animal. In the healthy subject the hair should be soft and oily and should lie smoothly, but in animals suffering from fever or loss of condition arising from many causes, such as worm infestation or parasitic invasion of the blood (plasmosis, fly-disease) the hair becomes dry and brittle and the coat appears dull, staring and dusty. Some of the tick-borne diseases of animals in this country are accompanied by an unhealthy condition of the skin, which, again, appears to be particularly favourable to ticks—a most unfortunate association between cause and effect. In a healthy animal the skin is easily pinched into a fold and moves freely upon the ribs, while in sickness the animal may be “hide-bound.” One should examine the skin for such conditions as mange, scab, ringworm and tick infestation. In equines the cutaneous form of glanders (farcy) and the disease locally known as pyaemia (epizootic lymphangitis) are manifested by lesions of the skin, which will be described more fully later.

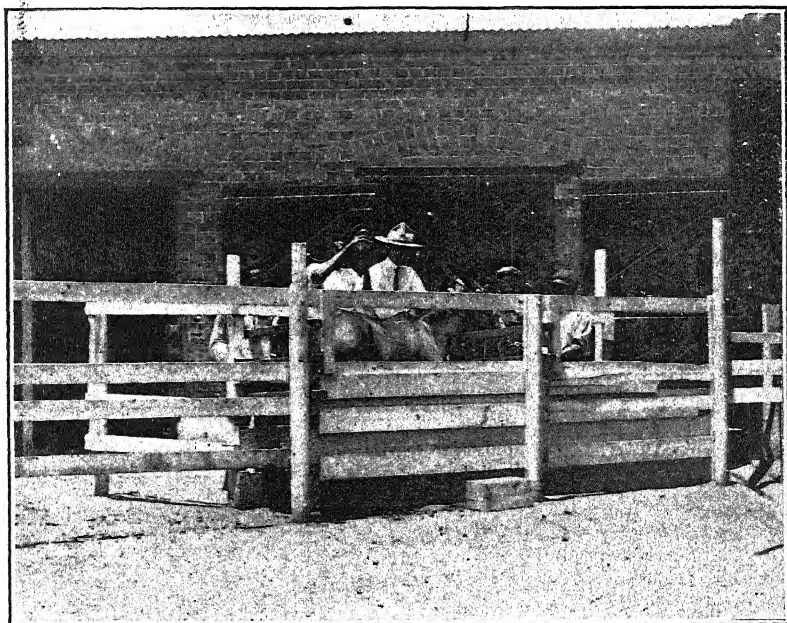


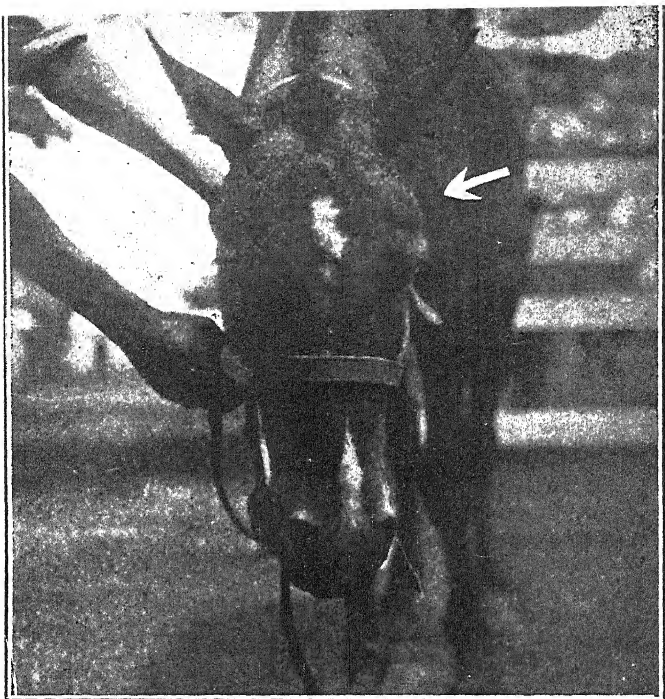
*This herd was infected with African Coast Fever.
The sick animals may be seen lagging behind.*





A "crush" improvised for tempering cattle suspected of African Coast Fever.





A case of Horse-sickness. Note the swelling above the eyes.





A sick Calf suffering from Anaemia.

Examination of eyes:—A clear bright eye is indicative of health and must be distinguished from the glassy lustrous eye associated with fever and pain. A dull appearance is sometimes given to an animal by the swelling of the tissues round the eye, as for example, in African Coast Fever and Redwater in cattle, and Biliary Fever of the horse. In the “dik-kop” form of horse-sickness a swelling may replace the hollow situated between the eye and the base of the ear.

Discharge from the eyes is present in some infective diseases and is, as a rule, bilateral (i.e., from both eyes). A discharge from one eye is generally caused by some local irritation.

Opacity of the cornea or transparent horny membrane comprising the forepart of the eye, may be caused by injury, but is often met with in specific diseases. e.g., tsetse-fly disease.

Some forms of ophthalmia are very infectious, and not only should the first cases be detected early and treated, but means should be taken to prevent the spread of the disease to in-contact animals. This is specially the case in the eye disease so common among calves. Some forms of ophthalmia, if not actually transmitted by flies are aggravated by them, and in equines it is advisable to protect the eyes with fly-fringes at those times of the year when insects are most aggressive. Further, the tears and inflammatory discharges should not be allowed to accumulate around the eye, since they appear to attract flies, which may eventually give rise to bad sores at the corner of the eye and along the tear tracts.

The conjunctiva should be examined. This is the mucous membrane lining the inner aspect of the eyelids and reflected on the front of the eye-ball. It also covers the cartilaginous body at the inner angle of the eye, known as the “membrana nictitans” or haw. In the horse an examination may be made by everting the eyelids with the thumb and index finger. By using the index finger for the upper lid and gently pressing the everted lid inward and forward into the socket of the eye, the haw is pushed over the ball of the eye and can be examined. In the ox a good view of the conjunctiva may be obtained by simply taking hold of a horn and the nose and drawing the head to one side. *The Colour* of the conjunctiva should be compared with that of other mucous membranes, and is of immense diagnostic value in-as-much as it serves

to determine the quantity and quality of the circulating blood. In this country the importance of the indications to be thus obtained cannot be over estimated. The normal colour of the conjunctiva of a healthy animal must be learnt by practice in order that deviations from normal can be detected and interpreted. It may be described as a pale rose-colour in equines, while in bovines it is rather paler than in other animals. A careful examination of both eyes should be made to guard against mistakes, and the colour should be compared with that of the lining membrane of the lips, gums and tongue. The colour of the conjunctiva is influenced by :—

1. The quantity of the blood in the system.
2. The quality of the blood in the system.
3. The distribution of the blood, depending upon the state of the heart and vessels.

A *pale* or *anaemic* colour indicates (a) that the quantity of the blood in the animal is less than normal, or (b) that the blood has not its normal quota of blood cells, or (c) that the blood cells are deficient in colouring matter.

The membranes may become suddenly pale, as from great loss of blood caused by external or internal haemorrhage.

The condition known as *anaemia* is frequently met with in animals in this country, and is brought about by many circumstances, such as deficiency of food, or the action of minute parasites in the blood stream, causing a diminution in the number of or actual mechanical destruction of the red-blood-cells (as in fly-disease, plasmosis). It may also be due to the presence of larger parasites, such as intestinal worms, which live at the expense of their host.

A condition of deficiency or poverty of the blood frequently results in the escape of the fluid elements into the various body cavities, such as the heart-sac, the chest and abdominal cavities (dropsy, "pot-belly"). The transuded fluid may also gravitate into the dependent parts, collecting under the skin or causing swelling of the limbs. The "tick fevers" of calves are frequently characterised by a pendulous condition of the skin between the jaws, which is often an indication of worm infestation in sheep.

The condition known as *jaundice* is characterised by yellow discolouration of the membranes and tissues, the

varying shades of yellow being very well marked in the conjunctiva. This discolouration is due to an abnormal amount of bile-colouring matter circulating in the blood, which may be derived from (a) dissolution of the red blood cells, as for example, in diseases caused by blood parasites, *e.g.*, redwater of cattle, biliary fever of the horse, etc.; (b) reabsorption following the accumulation of bile in the liver as the result of some obstruction to its escape into the bowel. Various phenomena accompany jaundice, such as indigestion, constipation, clay-coloured faeces, general dullness and unthriftiness. When jaundice is associated with anaemia the membranes vary in colour from lemon yellow to ochre; when the membranes are, at the same time, congested or inflamed the yellow is masked and all shades of colour from salmon to brick-red are met with.

An increased *redness* of the membranes may be a temporary condition due to (1) over-excitement, or (2) to diminished power of the circulatory system, or (3) may indicate a depraved state of the blood which may be deficient in oxygen or may contain toxic materials. In those diseases which are caused by the invasion of the blood by micro-organisms this is frequently met with in the last stages, *e.g.*, horse-sickness, African coast fever. A congested condition of the conjunctiva may also be present when mucous membranes in other parts of the body are inflamed, as for example, in inflammation of the bowels.

(To be continued.)

Red Lincolns in Rhodesia.

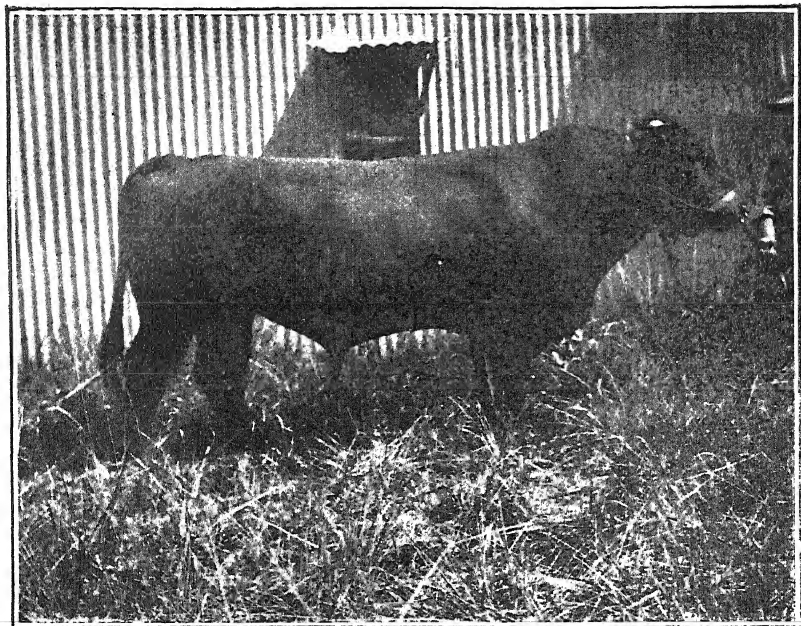
By G. FITZGIBBON, Mount Shannon, Salisbury.

In view of an article by Mr. G. E. Collins on Red Lincoln cattle, which appeared in the last number of this journal, it may be of interest to Rhodesian farmers if I endeavour to give some account of my experience with bulls of that breed and their progeny, though I must state at the outset that it is only a little over two years since I started breeding from Red Lincoln Bulls.

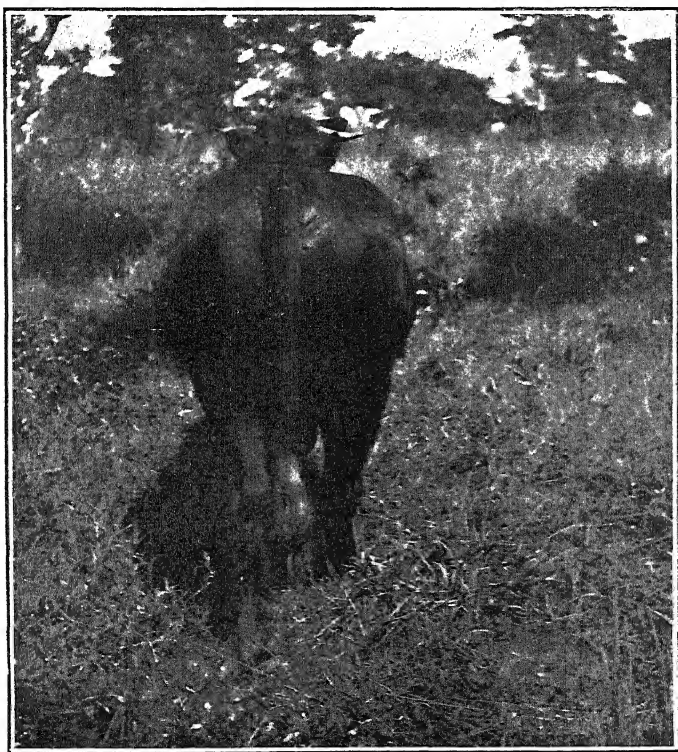
Like every new settler I was confronted with the question of what bull to use. I had been fortunate in getting together a very nice and even lot of red Africander cows and heifers, and was therefore inclined towards a red or roan bull and first imported a Coates shorthorn bull "Duke of Gloucester," who gained first and champion prizes at the local show. He died shortly afterwards from redwater fever before coming out to this farm.

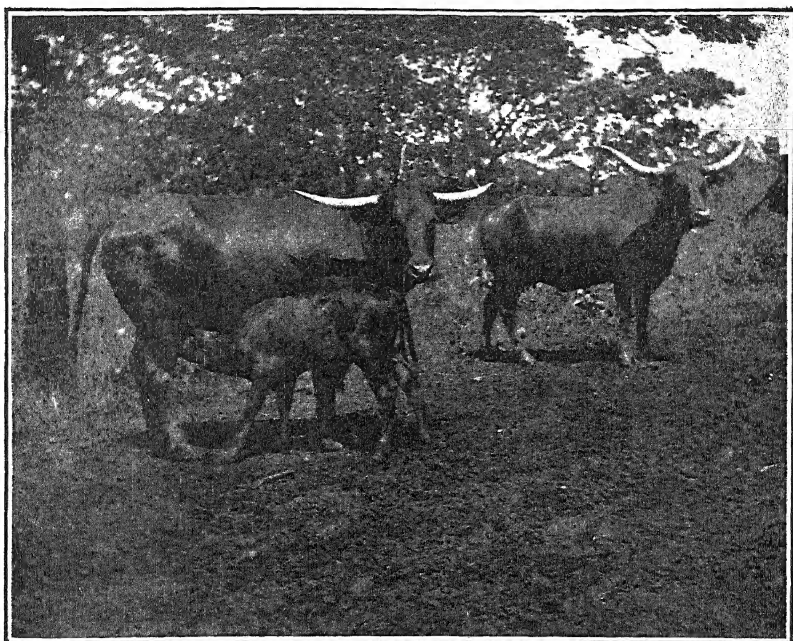
I then appealed to a well known judge of cattle in England and manager of a most successful cattle breeding establishment, who had assisted me in getting my first bull. After acquainting him with the conditions and climate of this country, his advice was "Red Lincolns," and that in spite of the fact that he himself only bred Coates shorthorns. In his opinion Red Lincolns are a hardier strain and more likely to get acclimatised and withstand the extremes of temperature of a tropical climate. What has always impressed me very much is that the excellence of Red Lincolns, namely their early maturity, hardiness, capacity for milk and great weight of carcase, has been gained by the tenant farmer who had to breed a beast that was most profitable, and not by the large land owner who breed admittedly an animal of great excellence, but which is bound to lose hardiness in gaining fancy points which are after all only of use in the show ring.

As a real utility breed Red Lincolns have gained a very high reputation at home, whether this will be upheld in this country can only be proved by experience. If, however, one



"Burton Wisp" (5924), 2 years 9 months old.

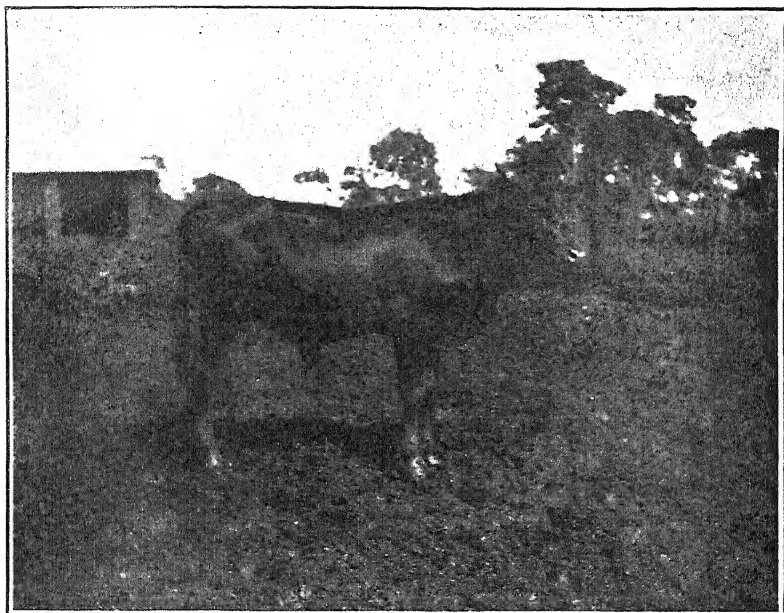




Two Africander Cows and grade calf.



Native heifer and yearling grade heifer calf by "Harpswell Surprise."



Nine month old grade bull calf, by "Harpswell Surprise."



Group of grade calves up to 4 months' old.

may judge by the results that it has been my privilege to see at Mr. Hull's farm near Bulawayo and from the less advanced results that I have obtained myself, there can be no doubt whatever that Red Lincoln bulls are most eminently suited to the conditions and requirements of this country.

The breed should always find favour with the farmers in Rhodesia from the fact of their being admittedly the best dual purpose breed. A Rhodesian farmer never knows when a mine might be started at his door when the splendid milk strain of the Red Lincoln will bring in a quick return, whilst he can always rely on getting a heavy carcase from his male progeny.

Red Lincoln breeders, more than those of any other Short-horn milk strain, have succeeded in impressing the high milking qualities through the sire, most notably has this been proved by Mr. John Evans, from whom I got my bulls, whose Burton milk records are the most complete and instructive of their kind.

It has been observed by all authorities on breeding that the influence of the sire is particularly strong in transmitting form and functional activities to the udder of the female progeny, and such transmission is most marked when the females are grades or of an inferior strain such as we have in our native cattle of Rhodesia.

We have therefore in Red Lincolns a breed which is an ideal dual purpose breed, eight to ten hundredweights being usual for grass-fed three-year-old bullocks and up to twenty-four hundredweights for full-fed cattle, and the honours gained at home and abroad in milking tests are sufficiently conclusive proof of their excellence as dairy cattle.

In January, 1909, I imported two red Lincoln bulls "Harpswell Surprise" (6078), Sire "Otby Dunsby" (4933), dam by "Poolham Tom" (195), and "Burton Wisp" (5924), Sire "Hainton Barrister" (4850), dam by "Croft Actur" (2472).

Both got successfully over the inevitable red water fever and the subsequent reactions, and have been running on the veld with the other cattle every day at all seasons, and have not had a day's sickness since. They are stabled at night, and get one feed of crushed mealies a day during the rainy season and ensilage during the winter.

The calves are practically uniform dark red, although some of the cows have white markings, and are, without exception, a very satisfactory lot and a most marked improvement on their Africander half-brothers and sisters, the yearling "grades" being as big as, and a lot squarer, than two-year old Africanders. A most marked feature is the udder development in female calves, six months' old grade calves showing teats bigger than two-year old Africander heifers. The accompanying photographs show the improvement, though it will, of course, be more marked when the grades are older, and I hope, on the next occasion on which a cattle section will be again a feature of the agricultural show, to prove the accuracy of what I have said and that the Red Lincoln sire embodies in a very high degree the qualities most required for improving our native cattle.

Irrigation Crops.

By R. LE S. FISCHER.

*This paper was recently read at a meeting of the Headlands
Farmers' Association.*

I have, since I have been in the country, seen the benefits to be derived from irrigation. For nearly twenty years past I have grown crops under irrigation in the winter to a great advantage. Apart from the benefits derived financially in having some winter crops, the farmer's time is occupied during that of the year when work is naturally short, and he is buoyed with fresh hopes in looking forward to the returns from his irrigated crops. The most profitable irrigated crops are wheat, oats, rye and potatoes—and every farmer has some spot on his farm where he can grow a winter crop, if not under running water, then at least in some damp vlei, which I have found by experience equally as good.

My chief mainstay in the past and the cause of my still being in the country I put down to the growing of winter crops, and my advice to all farmers is: grow as many summer crops as you can, but do not neglect your winter irrigation crops for the sake of getting some few mealies, beans or potatoes off the same ground that you could grow a winter crop on. Always let your land for your winter crop be kept clean and in good order, so that you can get your particular crop in at the proper time.

I have made several experiments regarding the time of planting and find the following dates most satisfactory:—

Wheat and Rye: April and first week in May.

Oats (Algerian): March.

Oats (Boer): April and May.

Potatoes and Beans: end of July.

Up to now wheat and oat hay have proved the most profitable irrigated crops but in my mind the latter will "slump" in the near future as it grows readily in all soils and the

consumption is limited. Wheat is the crop for the future and grows I may say to perfection with proper care.

The most important point in all crops and more so in irrigation crops and where your acreage is limited is the *right* seed and *good* seed. Many are the failures and great the loss I have experienced by putting in the wrong seed. Always take a well tried seed in your own neighbourhood before seed that does well elsewhere. The best wheat grown in this district is Early Gluyas, both for irrigated land and for naturally damp soils, this wheat besides being one of the finest milling wheats in the world, is a quick grower and ripens early, this being a great consideration, and is in my opinion at present the only safe wheat on the market. Bobs Rust Proof wheat, with which I have made several experiments lately is a very hardy wheat, crops well, and in my opinion can be used as a substitute in the absence of Early Gluyas—I may add that it is well adapted to vleiland. Bobs Rust Proof is not, however, such a good milling wheat as Early Gluyas, and takes a month longer to mature.

I find the average yield of wheat to be 5 bags per acre.

Rye is only suitable for dairy farmers, and those who are farming small stock. The best seed is Cape Rye, a strong grower stands drought well and ripens early. Horses do well on green rye and eat it readily.

Of the several kinds Algerian does well on any class of soil and makes as good a selling oat as any other when cut at the proper time; the main point against it is the length of time it takes to mature, and one might have losses in reaping if the rains are early and continuous. The old Boer oat is a very fine variety, ripening in good time but requiring a rich soil or one well manured. The yield of oat forage is approximately $1\frac{1}{2}$ tons per acre.

Hints on Irrigation : Small Earthen Storage Reservoirs.

By W. M. WATT, Government Agricultural Engineer.

In most schemes of irrigation it is desirable to provide for the storage of water. In some cases it may only be necessary to provide for the storage of night water, in others for the storage of several days' water, or it may be desired to store water from the wet season for use in the dry. In the first two cases, the storage would be supplementary to the main scheme, while in the last case, the whole success will depend upon the care and consideration given in selecting the site, in estimating the quantity of water to be stored, the area irrigable, the cost of the work and the return to be expected from the crops grown.

When selecting a site for a reservoir, great care should be taken. The bigger the undertaking, the greater should be the care. Good foundations are essential, and if these are not evident from a surface examination, they should be sought by sinking a few trial pits along the site of the proposed dam.

The best foundation is solid rock, but if the rock be smooth on the surface it ought to be roughened so that the earthwork may bind with it, and any tendency of the bank to slide upon the rock be reduced to a minimum. While solid rock is the most satisfactory, a good clay or compact clayey loam should answer very well as a foundation upon which to raise an earthen dam. When the ground is sufficiently sound to act as a foundation for the dam wall, but not sufficiently impervious to prevent leakage of water through it, a core of concrete or puddled clay is frequently placed in the middle of the bank and carried down through the impervious ground until it rests upon solid rock or some other more or less impervious material, but this question will be dealt with further on.

Another important point to be considered is the nature of the ground in the neighbourhood of the dam site, to decide

whether it is suitable for the construction of the bank. Most of the black vleis in Rhodesia are too clayey or contain too much humus to be suitable for dam construction. A fat clay soil is liable to become slushy, to slip and to crack, and generally speaking is too treacherous a material from which to form a dam embankment. The best material is one which contains a mixture of clay and gritty materials. Sufficient clay should be used to enable it to bind the mass and thus render it water tight, and enough gritty matter to give resistance against slipping. In India the proportions recommended are one of clay soil to one of pure shale or gravel. In America the proportion of grit used is very much greater, but the Indian practice seems the sounder. The following are the proportions recommended by an American engineer: coarse gravel, 59%, fine gravel, 20%, sand, 9%, and clay, 12%. Most of our red soils are suitable for dam building, although in the case of high embankments, it would be desirable to add more gritty material to them.

In selecting the site, consideration should be given to the facilities afforded for constructing a permanent overflow, and in the case of large works for constructing temporary overflows to safeguard the bank during construction. In some cases a neck may be found some distance away from the proposed embankment, and if at a suitable level this would make an ideal overflow, but in the majority of cases an artificial overflow will require to be cut out on one or both flanks of the wall. If the slopes of the valley at the proposed site are not very steep, this should not be a very expensive matter, and a good deal of the spoil may be used in the bank.

We might now consider the catchment area above our dam site, and what percentage of the rain falling upon it is likely to run off and be available for filling our reservoir.

With a 30 inch rainfall such as we get in parts of Rhodesia, a good catchment area should give a run off of about 25 per cent. of the rainfall, an average catchment 18 and a bad catchment 10. No data in this connection have been recorded in Rhodesia, with the exception of some rough measurements taken by Mr. Hull at the Matopos dam. The catchment above this dam is an average one, and from the figures Mr. Hull kindly supplied, his run-off would average about 18 per cent. of the rainfall, but in years when the

rainfall is not intensive it probably falls as low as 10 per cent. As the first figures given are not based upon measurements taken in this country, but are deduced from data that have been collected in India, they cannot be absolutely relied upon for our conditions here, and unless the flow of the stream which it is proposed to dam has been measured over a period of years, it will be safer to assume a lower percentage when deciding how high to make our dam wall.

The impounding area for our reservoir is a very important consideration. The fall of the valley at the back of the proposed dam embankment should not be very steep, as the impounding area will then be restricted, as also the quantity of water stored for different heights of wall. It is impossible to lay down any hard and fast rule as to the greatest valley fall allowable. The best way to decide this is to calculate the quantity of water likely to be impounded, and from this to ascertain the area that could be irrigated by that water, the return likely to be obtained should then be set against the estimated cost of the scheme, and if that return is likely to prove sufficient to more than wipe out the capital cost of the scheme in say 10 years time, the work, if carefully carried out, could be embarked upon. In this connection it should be remembered that there is more risk attached to a purely storage scheme than there is to a simple gravitation scheme which does not depend upon storage.

To measure the impounding area of a large scheme a contour survey would be required, but for a small scheme a farmer ought to be able to take the necessary measurements to arrive at the capacity fairly accurately himself. To do this it will be necessary to flag out the proposed full supply contour of the dam, and this could be done roughly by setting a carpenter's spirit level on a straight edge, and then holding this at the proposed over-spill level for the dam. By sighting along the straight edge, an assistant could be directed to put in flags at points where the straight-edge when brought to the level cuts the ground. Or this contour could be ascertained by one of the two methods described for levelling in the previous article on small gravitation schemes. This contour line as flagged out will probably be of a more or less elliptical shape, and as it is desirable to

ascertain the area embraced, it should be cut up into one or more regular figures such as squares, rectangles or triangles. In transforming the curved lines into straight ones, the straight lines should be ranged out so that the portions cut out from the curved portion should be approximately equal to the portions taken in. To ascertain the area of a square multiply the length of any two sides together; of a rectangle multiply the length of one long side with the length of one short one, and of a triangle multiply the length of its longest side with half the perpendicular distance from that side to the apex. If the sides were measured in feet divide the products by 43,560 to get acres, and if measured in yards, by 4,840.

Having ascertained the area in acres, the average depth of the water should be found. In a very small work this might be guessed, but in one of any size, more accuracy is desirable. This might be ascertained by means of a pole marked off in feet and inches, from which a large disc should be suspended on an endless cord passing freely through pulleys fastened at the top and near the bottom of the rod. By sighting across from one of the flags on the top water contour to an opposite flag, the rod being at a point between, the disc could be raised or lowered until the centre of it is cut by the eye at the correct level, and the depth then ascertained by the person holding the rod. These depths should be ascertained at several points at regular distances apart in lines ranged out across the valley. In ascertaining the mean depth all the recorded depths should be added together and divided by the number of observations taken. In doing so it should be borne in mind that observations will be necessary at the edge of the proposed top water level, where the depth will of course be zero, for unless these zero depths be taken into account, the correct mean will not be obtained.

Having now found the mean depth of the water in feet, multiply this by the area of the top water surface in acres and the product will give the capacity of the proposed reservoir in acre feet, *i.e.*, in quantities equivalent to layers of water one foot deep, with a surface area of one acre. The acre foot is the best measure when dealing with the capacity of a reservoir for irrigation purposes. For instance, assume we have found the area of the full supply water surface of

our proposed reservoir to be 10 acres, and the mean depth to be 6 feet, we would have 60 acre feet available with the dam full. Assume we expect to have to give an annual watering to our irrigable land equivalent to a layer of water 2 feet deep upon each acre, *i.e.*, 2 acre feet. Now leaving absorption and evaporation losses out of the question for the present, it will be obvious that if our dam contains 60 acre feet and each acre requires 2 acre feet, we would be able to irrigate 30 acres from one emptying of the dam. In irrigation an acre foot of water is a visible measurement which is more than can be said of gallons. In dealing with water furrows the cusec (cubic foot per second) is used. There being 43,200 seconds in 12 hours, a cusec would supply 43,200 cubic feet in that time, and as there is 43,560 square feet in an acre, it will be seen that 1 cusec flowing for 12 hours is approximately equivalent to 1 acre foot, *i.e.*, 1 cusec would cover 1 acre nearly 1 foot deep in 12 hours, or 4 acres 3 inches deep, and so on.

Before deciding upon the area we may expect to irrigate, the influx of water to the dam during the dry season would have among other things to be considered. In the writer's previous article on gravitation schemes, there are given four methods of measuring the flow of streams, and any farmers desiring to do so should from that article and this, have sufficient data to work upon to ascertain the value of any inflow of water he may have to his dam.

We may now consider the question of silt. In Rhodesia, I do not expect this need ever become so serious a problem as in more arid countries. The dense grass which covers the greater portion of the face of this Territory prevents the water running off the ground from attaining a velocity sufficient to carry any but the very finest silts in suspension. When the rains fall on burnt veld or bare cultivated ground this does not apply, and here and there one sees the ruinous effects of erosion due principally to the first-mentioned cause. The problem of erosion is not yet a serious one with us, but nevertheless it is one to be treated seriously by every owner of land, as it is a comparatively simple matter to deal with it in its early stages, but later on remedial efforts may be financially impossible. A small quantity of silt in a reservoir is not altogether a disadvantage as it renders the

bed more retentive, but if a large amount enters annually the capacity of the reservoir may become seriously reduced. In a large scheme the silt would be ascertained by measuring the proportion carried by the stream by means of silt boxes, but as the question is not of serious moment for small schemes, having drawn attention to the matter, we shall pass on.

Another, and a serious problem, is the loss of water due to evaporation and absorption. The following table gives the evaporation losses as recorded by evaporimeters at Salisbury and Bulawayo during the year 1910 :—

Month.	Salisbury. inches.	Bulawayo. inches.
January	9.85	11.25
February	6.85	7.58
March	7.03	6.64
April	7.60	8.28
May	8.30	8.90
June	7.00	7.36
July	7.64	8.72
August	10.50	11.47
September	12.35	14.01
October	11.26	13.52
November	10.28	11.23
December	9.80	12.53
Totals	108.46	121.49

The rates of evaporation as recorded are for Salisbury approximately 9 feet per annum, and for Bulawao 10 feet. The evaporimeter at Salisbury is not considered absolutely reliable, and the Revd. Father Goetz, who is the observer at Bulawayo, is of the same opinion regarding his instrument. The results are probably too high, but steps are being taken to have the instruments modified so that we may be more certain in the future of obtaining reliable results. As matters stand, however, failing other figures, it will be best to accept those we have. The evaporation loss need only be taken into account during the seven dry months, April to October, which as recorded for Salisbury amounts to 72.26 inches and Bulawayo 64.65 inches, or say 6 feet and 5 feet respectively. In Bombay, it is usual in the case of large projects to allow for a total evaporation and absorption of 4 feet

measured at the mean area of the reservoir, although in some cases allowances as low as 3 feet and as high as 7 feet have been made. In small shallow reservoirs the losses from evaporation will be higher than in large deep ones owing to the lower layers of water being more easily heated. From the foregoing figures, it will be seen that a dam with a maximum depth of water of 6 feet, from which no water has been drawn and omitting absorption losses altogether, might be dry at Bulawayo at the end of October, and have only one foot of water in it at Salisbury. The seriousness of this question cannot be too carefully pondered over, especially when contemplating storing water from the wet season for the dry, and when there is no counteracting inflow to the dam during the dry months.

The next source of loss to be considered is that from absorption, but no accurate estimate of this loss can be made until after the work has been carried out. The only thing that can be done to reduce it is to take great care in the material used, and in the proper construction of the wall, and also to see that it is founded on as sound and impermeable a foundation as possible.

We might now endeavour to make an estimate of cost of our works. The main items of cost may be considered to be (1) excavating for the puddle core, (2) clearing the ground for the foundations, (3) filling the puddle core, (4) earth filling for the embankment, (6) waste weir, (7) outlet, and (8) compensation for land submerged. Items 1, 2, 3, and 4 should be worked out in cubic yards and a price placed against each according to what the farmer thinks each cubic yard of the finished work will cost. It would only be misleading to furnish even average rates of cost for the different items, as they will vary in almost every individual case, chiefly owing to the class and cost of labour, the hardness of the ground and its proximity to the work, whether dam scrapers are used, and so forth. The cost of item (5) will depend upon the facilities for getting the stone, the distance it is away from the work, etc. Item (6) will depend upon the nature and quantity of the material to be excavated. The cost of item (7) will consist chiefly of the prices paid for piping, valve, etc., which could be ascertained from the merchants. No. (8) will of course only be incurred

as a cash transaction, if another owner's land is to be submerged.

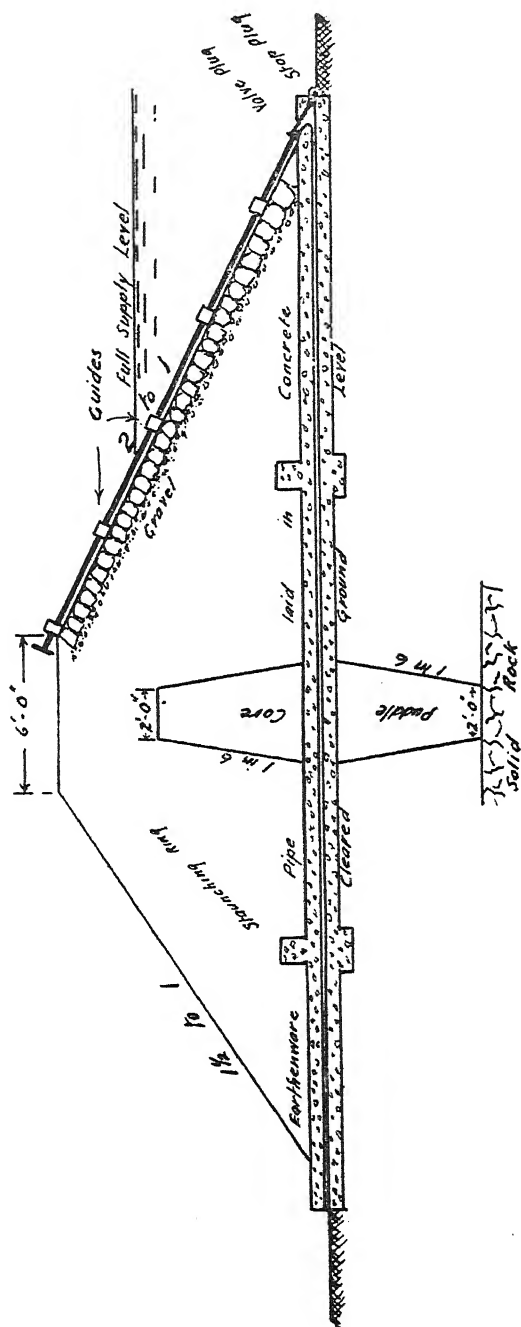
Having arrived at our estimate of cost, the probable return from the irrigable land should be thought out, and the remarks in this connection in the preceding article on small gravitation schemes will apply here with equal force.

Should we decide upon the undertaking, we might now settle upon the section of our embankment. For dams over 15 feet in height a farmer should have professional assistance in designing and constructing, as the bigger the undertaking, the bigger are the risks involved, and the larger the sum of money at stake. For dams 15 feet high and under, the following dimensions are recommended: Top width, 6 feet; up-stream slope, 2 to 1; down-stream slope, $1\frac{1}{2}$ to 1; and a freeboard of $1\frac{1}{2}$ to 5 feet (*i.e.*, the top of the dam to be $1\frac{1}{2}$ to 5 feet above the highest estimated flood level according to the height of the wall). A slope of 2 to 1 means that for every foot in vertical height the base of the slope will be increased by 2 feet, a slope of $1\frac{1}{2}$ to 1 that for every foot in height the base will be increased by $1\frac{1}{2}$ feet, and so on. Such a dam is shown in the accompanying sketch.

It will now be desirable to peg out the base of the dam, as its bottom width will vary with the height. If the top length of the dam is not very great, this could be done by tightly stretching two wires or two lengths of strong cord across the valley at the level intended for the top of the dam. Measuring poles held vertically alongside the wire or cord will enable the height of the proposed bank above ground level to be ascertained and from this the base. For instance, if the upstream slope be 2 to 1, and the rod held vertically alongside the upstream wire shews at one point a height of 10 feet, if turned over horizontally at right angles to the centre line of the dam, a peg put in on this line at 20 feet would give the toe of the base at that point. This operation may in the first instance be carried out roughly to ascertain the area of ground that has to be cleared of growth, roots, etc., and then repeated more accurately so that the base for the new work may be exactly determined.

If a puddle core is required, a trench should next be carried down to rock or to some impermeable ground. The bed of this trench should be roughened so that the puddle

— FIG. No 1 —



can bind with it and the sides and bottom of the trench be slightly wetted before adding the puddle. The material for the puddle should be the fattest and most retentive clay obtainable within a reasonable distance of the work. Some of our anthraces afford material suitable for this purpose, but any material having much grit or any excess of lime should be discarded. The puddle should not be wetted more than necessary to render it impermeable. It should be kneaded in balls and thrown into the trench, and the whole work carried out with as much expedition as possible, to prevent cracking. The puddle should be stamped or rolled so that no airholes are left in the work. Should there be any water in, or entering the puddle trench, this should be pumped out or drained away in pipes. In carrying the puddle above ground level, this should be done simultaneously with the earthwork filling to the embankment. A suitable section for a puddle core is shewn in the accompanying sketch.

Before starting the earthwork filling, it will be desirable to place two or more batter planks in permanent position on each slope of the embankment as a guide in keeping a uniform and correct profile. These batter planks can be erected by lashing them to a peg on the ground at the toe of the embankment and the correct slope given to them, when they might again be lashed to a peg driven firmly into a mound of earth 4 or 5 feet in height. It will not be necessary to carry the planks at once to the full height of the work, as they can be advanced as the earth filling proceeds. A line held at the back of any point on one batter plank will give the correct batter of any point on the face of the slope by moving it up or down behind the other batter plank. By this means the profile of the slope of the wall will be kept uniform and have no unsightly billows and bulges in it. No earthwork for the filling of the embankment should be taken from either side of the bank nearer to the toe than a distance equal to the height of the finished bank.

It might be advisable to point out that giving a convex curve to the upstream side of an earthen dam embankment is of no practical value in adding to its strength, and only entails a larger quantity of earth filling. There are a large number of arched masonry dams in existence—notably the Bear Valley and Sweetwater Dams in America, but between masonry or concrete and earthwork there is a vast difference.

The efficacy of an arch when pressure is applied to it depends partly upon the power of the material of which it is made to transmit thrust to the flanks. Before an ordinary earthen dam wall could do this, it would have to become compressed until it was a much more solid body than it ordinarily is, and in the course of this compression it would be sliding on its base, and this would mean certain disaster.

In raising the embankment the earth filling should be laid in layers not exceeding 6 inches thick, and each layer properly consolidated, by rolling or by stock walking over it, before the next succeeding layer is applied. The reason for the thinness of each layer will be obvious to any one who cares to try and consolidate a layer of earth 6 feet thick. Before the next layer is applied the ground upon which it is to be laid should be slightly wetted so that the new work can bind. The earth filling can best and most economically be done by means of dam scrapers worked by mules or oxen. This method has the further advantage that the animals walking over the work tends to consolidate it.

In repairing an old dam, the surface of the old work should be stripped and shelved so that the new earthwork is dovetailed and has a reasonable opportunity of binding with it. Furthermore the sides of the old work should be slightly wetted before adding the new.

No material should be used in the dam which contains organic matter or much calcareous matter. The former will rot in time, and either leave holes in the work or cause undue settlement, whilst lime prevents the earthwork from binding properly.

When any wave action is anticipated, the water slope of the dam should be pitched with dry stone. This stone should be placed on end or edge with its flat planes perpendicular to the slope. Instead of laying this pitching on the earth work, it is customary in good practice to lay it on a layer of gravel or shaly material as this prevents the waves and water which get through the voids in the pitching from washing away the earthwork. If the earthwork becomes washed out, there will be the danger of the pitching subsiding.

The downstream side is also frequently pitched with stones to prevent erosion of the slope by rain, but in the case of small dams, it will be quite satisfactory and more economical to plant some grass, such as "quick," which should bind the earth and prevent erosion.

We may now consider the waste weir. This should be so designed as to be capable of carrying off the largest probable flood with a low depth of water over the crest. This means the overflow channel should be wide and shallow in preference to being narrow and deep. Insufficient wasteway accommodation is one of the most frequent causes of failure of earthen dams, and any undue stinting of expenditure in this direction is false economy. In estimating the accommodation necessary, it should be borne in mind that we have to provide for passing the greatest possible flood. Unfortunately no figures can be given in this direction, as hardly any two cases will be alike. If possible the flood discharge of the stream should be measured and then an extra allowance made for the highest flood expected.

The following table gives the approximate discharges of a waste weir channel, having a bed width of 20 feet and a bed slope of 1 in 100.

Total Depth in feet.	Mean Velocity of tail channel. Feet per second.	Discharge in cusecs.
1	3.40	47
2	5.78	145
3	7.78	274
4	9.66	444
5	11.42	651
6	13.03	878

Waste weir channels having a greater or less bed width may be found proportionally. For instance, a 10 feet bed width would give discharges of one half, and a 40 feet bed width double that given in the table. The waste weir channel should be in solid ground or if not should be pitched with dry stone placed on end. A protective training embankment may also be necessary to prevent the overflow water from damaging the main embankment.

Another common source of danger is the outlet pipe. This danger can be entirely obviated by drawing the water from the dam by means of a siphon over the embankment. At our altitudes in Rhodesia a siphon should not be expected to work satisfactorily over banks higher than 20 feet. The inlet of the siphon should be a few inches below the lowest level at which it is proposed to draw off the water, and the outlet should have as much fall below the inlet as may be available. Before it will work, the siphon must be primed with water. This can be done in the case of a flexible hose pipe, which should be armoured, by plugging one end and

filling the tube with water, when the other end should be plugged. One end should then be inserted in the water and the plug withdrawn, the outer end should then be lowered below the water level when if the outlet plug be withdrawn the water will flow through the siphon.

In iron or steel siphons, the ends of the legs of the siphon should be fitted with stopcocks and the siphon primed by pouring or pumping water into a tee piece fitted in to the siphon at the summit. When the siphon is full the tee should be plugged and the stopcocks opened when if all joints in the siphon are airtight the water will flow out of the dam.

When the outlet pipe has to be passed under the embankment the greatest care should be taken to have it well founded so that there can be no settlement. A rock foundation is preferable but in any case the pipe should never be carried through the bank itself but should rest upon undisturbed ground. The pipe should be covered in a ring of concrete and supplied with concrete staunching rings as shewn in our illustration. Where the foundation is of earth, the pipe should rest on a good broad footing of concrete to minimise any tendency of the pipe to settle.

A common practice amongst farmers is to place the valve at the outlet end, and where the work is not very large this method may be adopted. It is, however, preferable to have the valve at the inlet end, so that in the event of anything going wrong with the pipe, the water could be shut off from it and the matter remedied. A valve answering in this manner suitable for banks not higher than 10 to 12 feet is shown in our sketch. In works of greater magnitude, the usual practice is to construct a headgate or valve tower in the water above the inlet so that the valve or valves can be opened vertically. An approach bank and bridge is then constructed so that the operator can have access to the headgate or tower from the top of the embankment. In the case of the tower one has the advantage of being able at any time to inspect the valves and gearing.

Should the dam have been constructed for the purpose of watering stock, it is strongly recommended that the dam be fenced off and the water led out of the dam into drinking troughs. To permit animals to wallow about in the dam itself is only making provision for the easy dissemination of disease.

Farms and Farming in Rhodesia.

THE MAKONI AND M'REWAS DISTRICTS.

By H. GODFREY MUNDY, F.L.S., etc., Government Agriculturist
and Botanist.

Before proceeding to describe the methods of farming practised in the Native Districts of Makoni and M'rewas, it may first be well to explain that the soils of this tract of country are, for the most part, of granitic origin, and though small belts of formation do occur, the major part is what is broadly referred to as sand veld. In many cases, particularly in M'rewas, the formation soil is derived, not from diorite or schists, but from ironstone rock and where a heavy wash has occurred from adjacent kopjes, the soil is often rendered somewhat infertile, apparently from excess of iron salts.

MAKONI DISTRICT.

The native district of Makoni is mainly a granite veld area, but owing to the fact that it is intersected by numerous ranges of kopjes the areas of red and black soil derived from diorite, ironstone and schistose formation are more numerous than in M'rewas and usually of greater fertility. The district is 3,791 square miles (2,426,240 acres) in area, or nearly twice as large as M'rewas, and is bounded on the north and north-west by the Mafuri and Nyagadzi Rivers. On the west it marches with the M'rewas district, the rivers Macheke, Rusawi and Sabi forming the western and south-western boundary. Southward it extends to the N'tande hills and the Odzi river, while the Nyatandi, Sanyiki and Ruenya rivers mark its eastermost limits. Throughout its whole extent the country is extremely well watered by perennial streams, and the large stretches of moist vlel soil form an asset, the value of which is only now to a small extent being realised. To the north-east of the railway line the country is mostly covered with fairly dense bush, and is intersected by precipitous ranges of forest clad hills, but around Headlands and to the south-

west of the railway it is more open and undulating, well watered but with less frequent outcrops of formation soil.

The farm "Mona" now occupied by Mr. Munch was, in 1891, the scene of the first farming settlement under the leadership of Mr. Laurence van der Byl. Difficulties arose, however, and on the death of their leader, the young settlers for the most part drifted into other avocations, and until a few months ago, when the farm was re-occupied, little remained to indicate its historic interest save the tall blue gums surrounding the homestead and the stone marking the last resting place of the leader of the expedition. Messrs. Fischer Bros. were notable exceptions to the rule however, and instead of leaving the district they took up land at Headlands and occupied themselves in farming, transport riding and store keeping, with the result that to-day their joint farms are among the finest properties in Southern Rhodesia. The difficulties and the hardships to be overcome were numerous and severe, but the struggle has resulted in success, and one cannot but feel that where equal grit and perseverance is shewn the end will be the same. Difficulties just as numerous appear to confront the new settler of to-day, and it is only by patience and determination that the battle with nature can be won.

The resident farmers in the district number about forty, but the beneficially occupied farms are considerably in excess of this, since the majority of older settlers own two, or even more farms. Two local farmers' associations are supported, one at Headlands and one at Rusapi, conveniently dividing the settled farms into two sections and thereby facilitating the meeting of members at their more accessible centre. The Makoni farm residences and out-buildings compare favourably with those of any other part of Rhodesia. The dwelling houses on Coldstream Ranch, Lesapi Cave, Mona (in course of construction), Dunedin, Kirkly Vale and Springs leave little to be desired, while the farm buildings on Coldstream Ranch, Fischerville, Cornucopia Dunedin, and Marangowie are the best of their type.

Until recently, stock farming has been the chief aim of Makoni farmers, and there are a considerable number of cattle of improved type owned by Europeans. Recently collected statistics give the aggregate as 3,522 of which rather

more than two-thirds are breeding stock. The largest and finest herd in the district is that owned by Messrs. Fischer Bros., which numbers upwards of one thousand head. Other large owners are Mrs. Ross, Mr. F. Lapham, Messrs. Heron & Co., Mr. L. Lloyd and Mr. Lyle, while in addition there are other five or six nice herds ranging from 75 to 100 in number. The bulls used have been mostly Shorthorn, Friesland or Africanders, more or less pure, and our illustration shews the type of animal on Mr. Lloyd's farm Gorubi Springs. Mr. S. Michell on Dunedin has some very fine specimens of the Hereford breed and also a number of Shorthorns, and it is interesting to note that he finds the former breed lose their condition in winter more rapidly than the latter but recover it more quickly in spring. Mr. F. Lapham is breeding Friesland graded crosses and is obtaining a very useful half-bred animal of moderate size and fair milking qualities. Mr. Munch of Mona and Mr. Tapson of Ripplemead have imported Shorthorn, Africander and Friesland breeding stock from the Cape of Good Hope, and the former has several exceedingly nice Shorthorn heifers. The whole district is eminently suited to cattle raising and the existing herds form an excellent foundation for future improvement. The recent unfortunate recurrence of African Coast Fever cannot fail to give a check to stock farming but it is to be sincerely hoped that the restrictions now in force will prevent the further spread of the disease through the district.

Many of the farmers possess small flocks of Persian or cross-bred sheep, and the total number for the district is estimated at fourteen hundred sheep and about one fourth as many goats. The largest owners are Messrs. Fischer Bros., Messrs. Heron & Co., Mr. Tapson and Mr. Allers on Inyagura, and from the appearance of these flocks there seems good reason to hope that sheep raising may, in the near future, become of considerable importance to the district. In the more outlying parts there is at present no little danger from vermin, such as leopards and wild dogs, but in time this will doubtless be overcome. The veld is well suited to improvement by the introduction of exotic grasses which will provide succulent grazing during the winter and the sowing of oats or rye in March or April, for feeding off with sheep in mid-winter is worth the attention of all farmers who are interested in sheep breeding. This plan is successfully

adopted in many other countries, and in Rhodesia would largely obviate the grazing of sheep in and near wet, stagnant vleis—a fruitful source of infection by wire worm and other internal parasites. During the rainy season especially, it is important that the flock be grazed on the ridges and high-lying ground, and breeders should, as far as possible, keep their sheep on restricted areas, since in this way the natural veld will be sweetened and improved more rapidly than if a small flock is run over a comparatively large area of grazing land.

Pig raising is somewhat neglected, and indeed several farmers complain that they have tried pigs but have found them unprofitable. There must be some explanation for this other than the fault of the pigs, and it seems unthinkable that at the present price of maize pig-feeding, if run on proper lines, can be unprofitable. The soil is well adapted to growing crops such as ground-nuts, sweet potatoes, and native potatoes (*Plectranthus* sp.) at very small cost, and eminently suited to pig food, and on those farms where dairying is practised there should always be separated milk for the porkers. The total number of pigs in the district at present is about three hundred, and the largest owners are Mr. Lapham of Marangowie, and Messrs. Fischer Bros.

Mr. Power on Silver Bow, is turning his attention to poultry raising, and has more than five hundred head on the farm. He has chosen an ideal position for his runs, and when the farm was visited the birds were mostly in the pink of condition. We give illustrations showing Mr. Power amongst his chickens. The total number of poultry in the district is about two thousand.

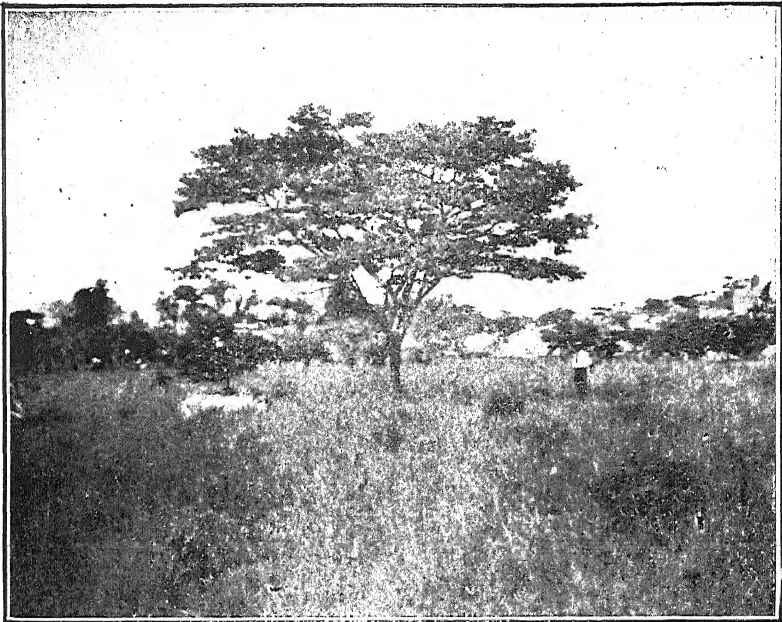
In spite of the fact that Makoni district is mainly a sand veld area, the growing of summer crops in all its aspects is practised to a considerable extent, and from figures recently collected the approximate acreages given are as follows:—Maize, 3,000 acres; beans, 200 acres; potatoes, 40 acres; tobacco, 100 acres; pumpkins, 10 acres; and ground-nuts 6 acres. The last item is perhaps the most remarkable—on a soil pre-eminently suited to it, the growing of ground-nuts is practically neglected, yet at the time of writing Rhodesia is unable to supply her own requirements of this commodity, and is daily importing supplies of kaffir grown nuts from



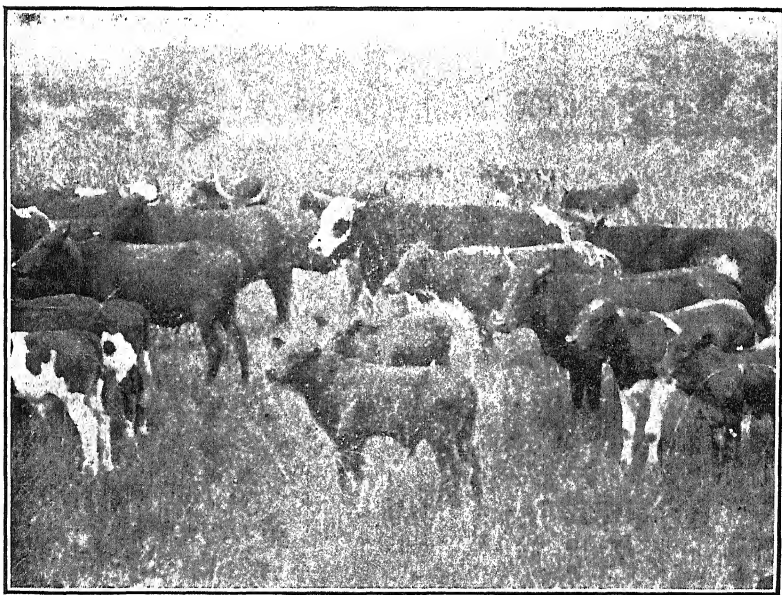
"Lesapi Cave." Group of Mr. H. Michell's cattle.



"Silver Bow." Chicken rearing.



*"Silver Bow." Shade and rock shelter with grass,
suitable for sheep.*



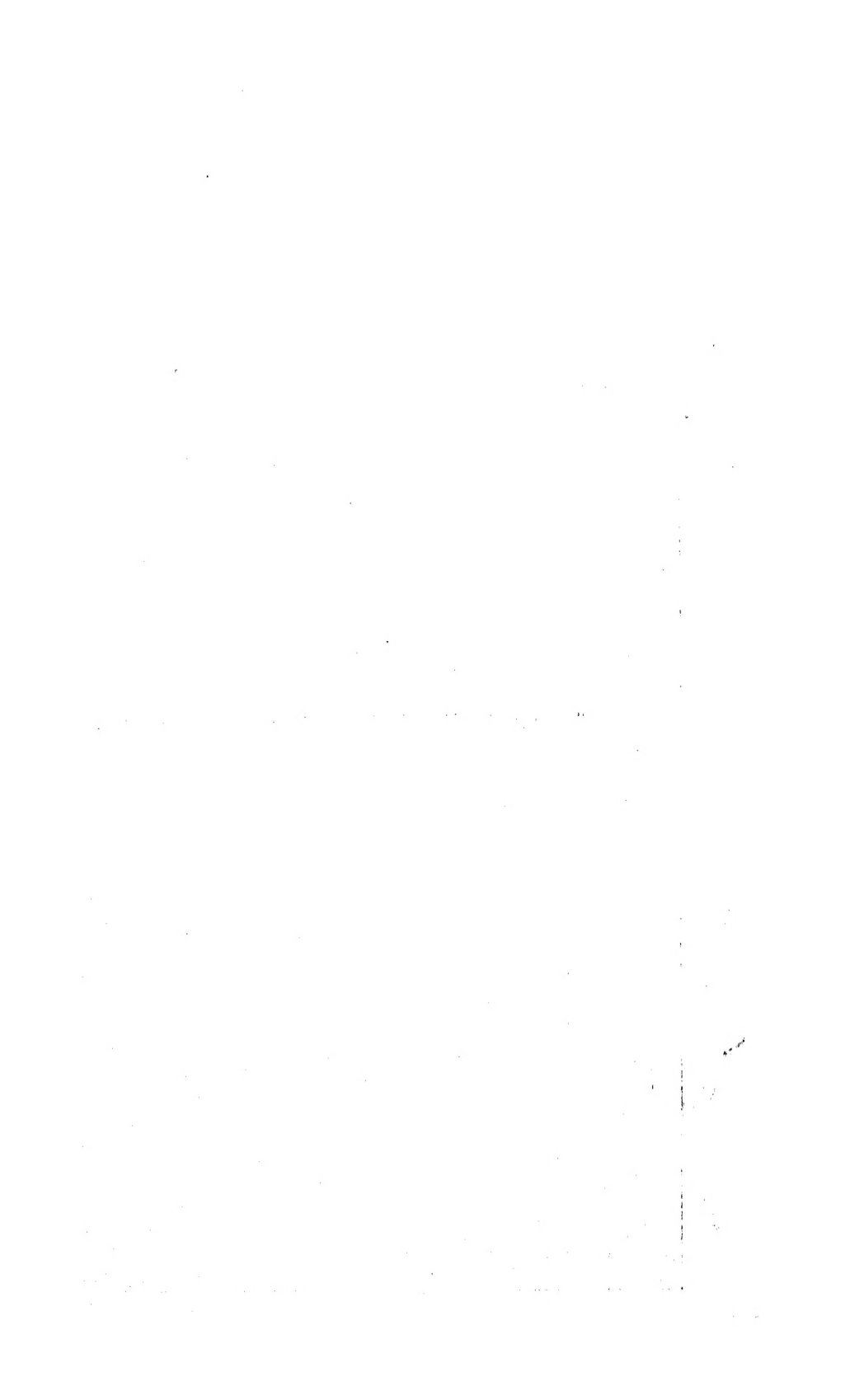
"Gorubi Springs." Some of Mr. L. Lloyd's cattle,

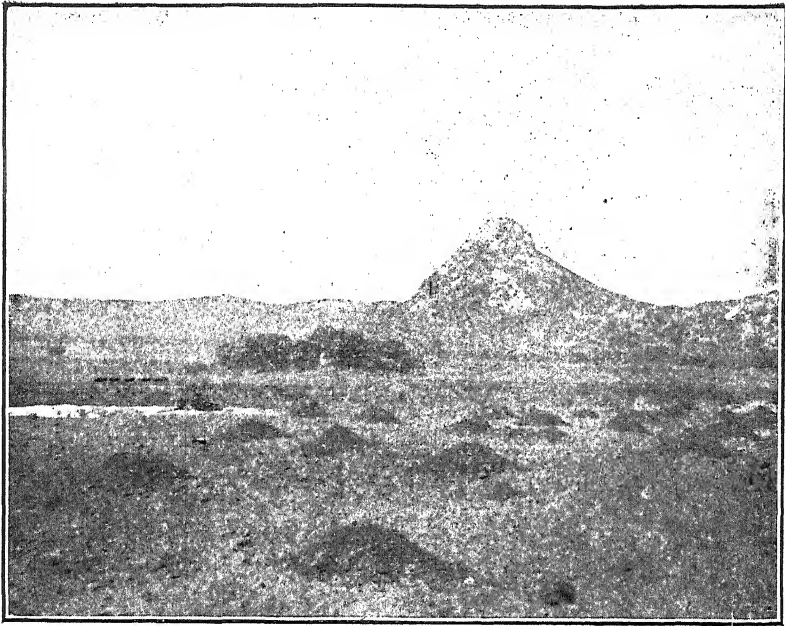


"Silver Bow." Mr. Power is a poultry expert.

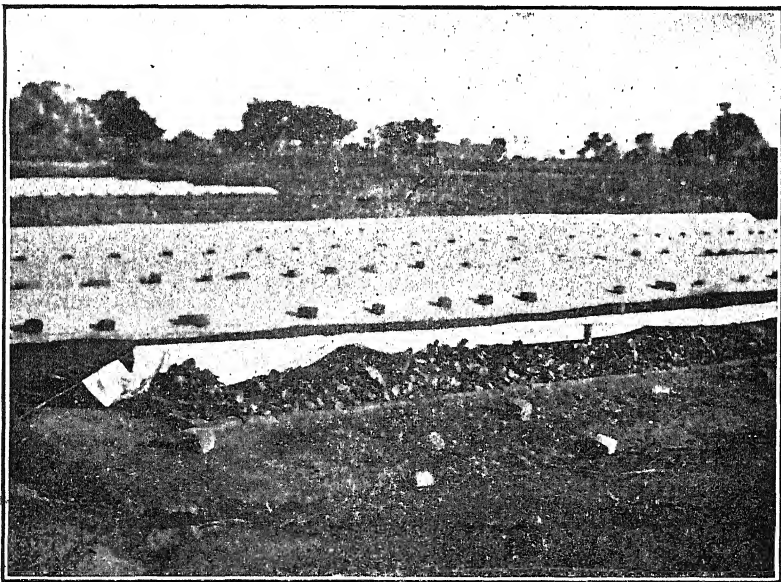


"Silver Bow." Storing forage.





Mt. Cheronga. Vlei soil. Wheat, etc.



*"Silver Bow" Tobacco Seed Beds.
Plants overgrown for want of labour to transplant.*

Portuguese territory. Owing to the relative poverty of soil the growing of maize is never likely to become of great importance, and in course of time the local production will probably be reduced to the minimum necessary for home feeding and for conversion into beef and pork. On the few favourably situated farms where crops of ten bags and upwards per acre are now being reaped, better methods will increase the yield, and the owners will be able to contribute to the requirements of the Odzi and Penhalonga mines, but for the district generally, other and relatively more profitable crops must be forthcoming. Supplies of kraal manure are, at best, limited, and it is impossible to manure large tracts of land by this means. The alternative on the sand veld farm is to utilise the manure in growing small acreages of more profitable crops such as onions, beans, ground-nuts and potatoes. The white haricot and the Canadian Wonder are at present the most popular kinds of beans, but it may be remembered that the Kimberley mines offer an attractive price for sugar beans if produced in sufficient quantity to obtain the railway rebate.

A considerable acreage of winter wheat and oats is already grown in the district, and the area of land thus utilised will year by year increase. At the present time one hundred and thirty acres are devoted to wheat and one hundred and sixty-five acres to oats, the bulk of this being irrigated land. During the last two seasons the Department of Agriculture has repeatedly called the attention of farmers to the possibility of growing winter cereals—wheat, oats, barley and rye on moist vleis soils without irrigation. A number of tentative trials have been carried out by Makoni farmers, and as far as is known, there have been no failures which cannot be accounted for, owing to unfavourable treatment, either in time of sowing or selection of a suitable site. The accompanying illustration shews oat forage grown on Silver Bow farm under these conditions, which, in quality, left little to be desired. Mr. R. le S. Fischer has 25 acres of vleis land wheat, and in a paper published on another page of this Journal speaks most highly of the results obtained and advises his fellow farmers to lose no time in commencing experiments on their own account. The writer fully endorses these views, and indeed goes so far as to say that there remains no doubt as to the possibility of wheat production on naturally moist

vlei land. Every farmer in Southern Rhodesia who possesses land of this character, which continues moist throughout the winter, should lose no time in testing its suitability to winter cereals. There remains a vast deal to be learnt before the most favourable results can be expected, but the main fact that wheat can be grown in this manner has been fully established, and further extensive trials are now necessary in order to ascertain how the land should be worked, when the seed should be sown, what varieties do best, and so forth. The home production of wheat is of inestimable value to any country, and the latent possibilities of the granite vlei land of Southern Rhodesia are exemplified by the results which have already been obtained in the Makoni district.

The recent highly satisfactory sale of Rhodesian leaf has given an further impetus to tobacco growing, and in common with other districts possessing similar soil, Makoni is favourably placed in this respect. The present season's crop runs to about 100 acres, but in most cases the planting is an experimental one and has been largely handicapped by scarcity of labour, which has been felt as acutely in Makoni District as in any other part of Rhodesia.

Most of the farmers have established small mixed orchards which are just now coming into bearing, and it is noticeable that in this district the temperate fruits such as apples, peaches, plums and possibly pears promise exceedingly well. Much of the country is too cold and exposed for citrus fruits, but these may be expected to thrive better when adequate shelter belts and break winds have been established. The district at present boasts of over 3,000 mixed fruit trees.

Possessing as it does a salubrious climate, as compared with many other parts of Rhodesia, a natural veld eminently suited for stock raising, and which, when fed off and improved with exotic grasses, should be well adapted to sheep, and a soil capable of growing bright leaf tobacco, and on the lower levels winter wheat, barley and oats, the Makoni district appears to offer prospects for the future which can hardly be surpassed elsewhere in Rhodesia.

M'REWAS DISTRICT.

The native district of M'rewas lies directly to the east of the Goromanzi District, and to the north of the Beira-Salis-

bury railway line. In shape it is a long, narrow tract of country extending lengthways north and south, and only abutting on the railway for a distance of a few miles, where Macheke station is situated. Compared with other districts of Mashonaland, M'rewas is relatively small, being only 2,600 square miles, or approximately 1,665,000 acres in area, and of this more than one half is comprised of native reserves—Mangwendi occupying the centre of the district, Fungwi the extreme northern corner on the banks of the Mazoe River, and Umzumba and Maramba lying midway between the two.

The district is bounded on the north by the Mazoe river and on the west by the Inyagui. The south and south-western border marches with the Marandellas district and the railway line, while the Mafuri river marks the south-eastern and the Nadiri river the north-eastern limits of the district. The headquarters of the Native Commissioner, Mr. Edwards, are at M'rewas, as is also the camp of the B.S.A. Police.

With one or two notable exceptions the farms are but recently occupied, and at present only the southern part of the district within a radius of about twenty-five miles from the railway line has been settled. This portion of the country is well watered, mostly by perennial streams, but in the northern half, water is more scarce, and in places the soil is arid, thickly covered with thorn scrub, and but sparsely populated by natives. The contour of the country falls towards the north, and while that adjacent to the railway enjoys a climate very similar to that of Marandellas or Rusapi, as the Mazoe valley is approached the conditions become more tropical, as is made apparent by the presence of the wild banana (*Musa sp.*), the wild date palm (*Phoenix reclinata*), and the indigenous bamboo (*Bambusa sp.*).

Throughout the district the soil is of granitic origin, but here and there small areas of black and red soil are found overlying the granite and formed for the most part by the denudation of ironstone kopjes. Most of the occupied farms are situated in positions where this has occurred, as for instance the four or five farms situated at the foot of Mount Bagota, those around Caskie Ben, and those again adjoining and to the north of Jelliman's Rest. The resident farmers in the district number fifteen, and it must be admitted that at

present the standard of farming is not as high as it might be. This is accounted for, however, by the fact that the greater number of the farms have not been occupied for more than two years, and further that farmers have been somewhat at a loss to know in what direction to turn their energies, since distance from railway, low prices, lack of local markets and the comparatively small crops which have been produced per acre, all tend to discourage the growing of maize. The estimated area under crop last year was about 1,100 acres, giving an average yield of $4\frac{1}{2}$ bags, and the present season will see this acreage increased by about one-half. In any case, however, it would not appear that M'rewas is ever likely to figure as an important maize producing centre, and farmers must realise that if they are to grow the crop at all profitably, more scientific methods must be adopted.

The most important crop in the district is oat forage, of which there is upwards of 260 acres sown annually. One grower, Mr. A. R. Jelliman, contributes over 200 acres to this total, and the remainder is distributed amongst four other farmers. At 7/6 to 8/- per hundred pounds, oat forage is an exceedingly paying crop, but in view of the difficulty of transport with so bulky a produce, it is by no means certain that wheat at its present price of 27/6 to 30/- per bag, would not be even more profitable, particularly since the straw remains on the farm for winter feed and gradual conversion into manure, or may be sold off the farm as chaff or litter. To those farmers at present growing oat forage on their irrigated land a trial with wheat may be recommended; meanwhile, where conditions are favourable the oats can be transferred to damp vleis soils which remain moist throughout the winter. At present the acreage of wheat is very small, and the total output would not exceed fifty bags a year. Of other crops grown, potatoes occupy about 20 acres and beans about 30 acres, while of fruit trees there are three thousand five hundred.

No account of the M'rewas district would be complete without reference to the farms occupied by Mr. Jelliman, on which an enormous amount of work has been done, and on which there are said to be more than thirteen miles of water furrow, and well over two hundred acres under irrigation. Much of the soil is of a sandy nature but grows good oat

forage, and there is no doubt that if the site were well chosen some of it could be put to greater profit under lucerne and tobacco. Mr. Jelliman is at present experimenting with rice sown in the lower lands as a summer crop assisted by irrigation, and is also testing the possibilities of irrigated winter pastures. The great possibilities of these farms are yet unplumbed, their only disadvantages being the scattered nature of the irrigated lands and in places the comparative poorness of the soil, but with a goodly number of cattle and sheep and an abundance of kraal manure the latter of these can be overcome.

The horned stock owned by farmers number about one thousand, of which four hundred are oxen and the remainder breeding cattle. The largest owners are Mr. Jelliman and Mr. de Jaeger. Messrs. Tredenick, Williams and Palms have lately taken up land on the Fairfield Estate with the object of ranching on a large scale, but at the time the present statistics were collected their cattle had not arrived. Speaking generally the need for better bulls is very apparent throughout the district, and the majority of cattle are but little improved beyond the native Mashona beast. The veld, though light, is usually of good quality, and there is no question as to the suitability of the district for ranching. It appears probable that a light and hardy breed such as Sussex and Africander crosses will do best until the veld has been more heavily stocked, but on farms possessing a limited area of arable land the main object should be to grow crops which can be turned into meat or dairy produce and sent off the farm in the form of beef, mutton or pork. Where small acreages are under irrigation more attention might well be given to dairying and for both the latter purposes, and where winter feed is available, a heavier type of beast might be introduced.

A few small flocks of sheep are to be found but the aggregate only reaches 500, and as a rule the animals receive but little attention except what is absolutely necessary. What sheep there are appear to thrive well and will doubtless do better if such simple precautions as foot baths and a central dipping tank in some convenient situation adjacent to several farms were provided. It is a common mistake in Rhodesia to suppose that with a minimum of attention sheep can be run

successfully on untamed and often rank veld, and when M'rewa farmers have realised that if their sheep are to thrive, steps must be taken to keep them free from ticks and intestinal parasites, there is no reason why the raising of a mutton breed and later, possibly merinos, should not attain considerable importance.

Of other farm live stock the district is almost entirely lacking, pigs number about thirty, horses, mules and donkeys about twenty, and poultry about four hundred. As has already been said, most of the farms are very young, and the next few years will doubtless see a big increase in the number of livestock of all classes. If one may venture to foretell the future, it seems that mixed farming combined with dairying and pig-raising should be the goal of those farmers possessing either irrigation or good summer arable land. The success of tobacco on granite soils indicates the possibilities of a crop which is at present entirely neglected by the M'rewa farmers, but which should offer good prospects in the district. The growing of small grains, such as wheat, oats, barley and rye on naturally moist soil without irrigation might also be attempted, as has been done with such marked success in the adjoining district, while veld improvement by the introduction of the hardier winter pasture grasses such as *Paspalum* and others, is worth the attention of all stock owners.

The absence of mines in the district, affording a local market for all classes of farm produce, has proved a considerable handicap to the pioneer farmers of M'rewa, but should the Kaiser Wilhelm Mine fulfil expectations, the demand for supplies of grain and vegetables for feeding the native labourers will do much to stimulate arable farming. In common with other districts the difficulty of obtaining an adequate supply of native labour has recently been felt, and this in itself has proved a serious deterrent to the development of newly occupied farms.

Our Two Indigenous Conifers.

BY C. F. M. SYNVERTON, F.L.S.

MILANJI YELLOWWOOD (*Podocarpus milanjiana*, Rendle).—Originally described from specimens in Whyte's milanji collection in 1894 (Trans. Linn. Soc., p. 61). It is near *P. Thunbergii*, the well known yellow-wood of the Cape forests but is distinguishable by its narrower, longer leaves and much larger, not solitary spikes. The timber, of which I have a specimen in my collection, appears very similar. I originally came across the tree in September of 1906 in some of the denser forest patches of the Chimanimani range, at an elevation of from 6,000 to 7,000 feet; small trees bearing male spikes only. But I have since seen far larger specimens (up to 3 feet in diameter) at about the same elevation on Mount Pene or Singwekwe. It there makes a magnificent tree, far larger apparently than any met with by Whyte on Milanji, with somewhat rough bark and dense masses of dark green foliage. It should be well worth cultivating.

MILANJI CEDAR (*Widdringtonia Whytei*, Rendle).—This fine timber tree was also originally described from Mount Milanji in Nyasaland, at an elevation of from 6,000 to 7,000 feet. It appears to occur there under very much the same conditions as prevail in its chief Rhodesian habitat, for Whyte's description of Milanji would apply nearly as well to our own Chimanimani Mountains: "An isolated range of, for the greater part, precipitous mountains, the main mass forming a huge natural fortress of weather-worn precipices or very steep rocky ascents, sparsely clothed with vegetation. Many of its gullies and ravines are well wooded and in some of them fine examples of grand African virgin forest are met with."

Our Melsetter tree was described as a separate species and named after Mahon, who first collected specimens of it. But the characteristics on which it was separated (the size of the cones and the alleged lack of the bluish tinge usually met with in the foliage of young trees on Milanji) did not stand the test of further investigation; I have found both kinds of cone growing on the same tree and have

noticed numbers of trees, both wild and cultivated, that have showed the bluish tinge in a marked degree. It may depend to some extent on soil; for out of fifty-five young trees of my own that have been planted on a poor washed out slope not one lacks it; while out of a dozen or more on somewhat better soil at the same elevation only two possess it, the remainder being of the dark green hue described by Mahon.

In the wild state the Chimanimani Cedars as they are here called, stand chiefly on the edges of the forest patches; one finds comparatively few cedars inside the forests, though in one such spot on the Chimanimani I noted a fairly compact group of thirteen large, straight single-stemmed specimens as well as many younger, the largest number I have seen together in one place. Groups of three or four are not infrequent, and large numbers of seedlings may sometimes be seen growing together in a densely packed mass, to be thinned out later by fires.

It is probably due to these annual grass fires that the habitat of the species is so restricted. Even in Southern Melssetter (3,000 to 4,000 feet) it flourishes exceedingly wherever planted and is doubtless excluded from this part of the district in its wild state chiefly by the ranker growth there of the grass, resulting in severer fires. Even on the Chimanimani, where the grass is extremely short, the trees suffer greatly. One, about two feet in diameter, had its base completely burnt out and was standing on tiptoe, so to speak, on its projecting lateral roots; nevertheless it was healthy in appearance and was bearing an average crop of ripe full-sized cones. Not far away the grass fires, which must have been exceptionally severe in 1906, had swept right through a couple of acres of incipient forest (certainly of some years' standing, as it averaged fifteen feet in height) and had completely killed everything it contained, including a very large number of young cedars. These had in most cases been hollowed out subsequently by a large "Carpenter" bee (*Xylocopa* sp.). On the opposite side of the ravine was a long irregular semicircle of cedar trunks, some of them large, all of them charred and completely dead, separated from the present forest margin by a broad band of richer and greener vegetation than the grass outside.

The tree grows always in small numbers and at elevations of between 5,500 and 8,000 feet, on the higher hills about Melsetter and along the Portuguese border between that place and the Umvumvumu river, as well as on the Chimanimani range and on the higher spurs of the mountains between Mount Pene and the Tanganda head waters—almost entirely in the glens, along streams, on the edges of patches of forest and on sheer scarps or amongst rocks; anywhere in fact where there is some protection from the full force of the grass fires. I have I think, come across only two specimens (both fallen) that approached four feet in diameter and, generally speaking, a two foot tree is a large one for this part of the world. But one meets with a certain limited amount of quite usable timber, and Mr. Sims had certainly been misinformed when he described the species as occurring here only “as a gnarled shrub or small tree.” (Rh. Agr. Jnl., Dec. 1910, p. 204.)

At the same time it does not here attain the size it grows to in Nyasaland:—

“The most striking botanical feature of the plateau is a large cypress. The remnant left of this fine conifer is confined to a few of the upper ravines and valleys, the largest forest of them finding a comparatively secure habitat in the damp gorges of the Lutshenya valley. A few old scorched monarchs of the glen had a precarious existence pretty well up the southern slopes of the main mountain; but unless steps are taken to protect them, these interesting relics of the past are doomed to speedy destruction. It is deplorable to witness the devastating effects of the annual bush fires, from which even this lofty and almost inaccessible retreat is not exempt. During the dry months of August and September these fires, originating from the villages on the lower slopes of the mountain, gradually creep up the precipitous cliffs from tuft to tuft of grass until at last they reach the grassy plateau. Once there the work of destruction is rapid. The fire rages over the tableland and eats its way along the edges of the remaining belts of forest, annually scorching, if not burning, the bark and timber of the outside trees, and killing outright the young seedlings. In exceptionally dry seasons it appears that these fires have even penetrated some of the damp forests, and hundreds of giant cypresses lay prostrate and piled on each other in all stages of destruction, but generally

burnt right through at the base of the tree. Mr. Whyte measured several of these dead cypresses, and one (by no means the largest met with) was 140 feet in length and $5\frac{1}{2}$ feet in diameter at 6 feet from its base, with a clear straight stem of 90 feet." (Trans. Linn. Soc. 1894, p. 3.)

Residents in the township of Melsetter will probably agree that no better description than the above could be found for a grass fire in the Chimanimani Mountains; nor could its results be more graphically described. It is interesting that the species seems to be dying out on Mount Milanji exactly as in Rhodesia and from the same causes—accidental, not climatic.

The older trees may be divided roughly into two types. In one the branches tend to radiate from a single point; in the other the trunk tapers up straight, almost or quite to the top of the tree and the branches spring from it laterally. Younger trees have mostly the latter form so that the former is presumably caused by damage to the leader, whether by grass fires, wind or insect attack. Locusts will occasionally ring-bark the young shoots while a small, brilliantly-metallic phytophagus beetle (*Clasposoma* sp.) is not infrequently somewhat destructive here to the foliage and young shoots of this and other cypresses.

These "cedars" produce by far our best local timber, reddish in colour, light, handsome, easily worked, strongly scented and exceedingly durable. There are posts in the Government paddock at Melsetter which must have been eleven years in the ground and are stated to be still, with the exception of the thin outer layer of sap-wood (whitish in colour) as sound as the day they were put in. It is also very useful in house-building and for furniture. At the farm houses in Northern Melsetter one occasionally finds doors and tables made from it, and it was used almost exclusively and very successfully for the woodwork of a large house erected a few years ago in Melsetter itself—the present school.

Planted at various elevations and from local seed it has, even on the poorest ground, made a straight, even, and rapid growth, and appears everywhere to have been spared by the plagues that are stated to have attacked it in other districts. It is fully worthy of an extended trial.

Fumigation of Fruit Trees with Hydrocyanic Acid Gas.

By RUPERT W. JACK, F.E.S., Government Entomologist.

It is well known that fumigation with cyanide is by far the most effective remedy for scale insects on citrus trees. Enquiries concerning fumigation methods have been frequent at this office since its inception, so that it is hoped that this article will meet a certain demand. The intention is to furnish such information as an orchard owner requires for the purchase and operation of a fumigation outfit. That the article contains much information drawn from outside sources is inevitable, as an immense amount of work has been done in developing this process in the United States of America, and American methods have been adapted to South African conditions in the Cape Colony. The illustrations are necessarily mostly reproductions because fumigation covers in Southern Rhodesia are usually handled by very primitive methods, not suited for examples to be copied by beginners in the art.

The first matter to be considered is the selection of the material of which the cover is to be made. There is some difference of opinion in regard to what is best for this purpose. The former practice in California was to use 8 oz. duck, *i.e.*, duck of which a piece one yard square weighs eight ounces. After the cover had been sewn together it was treated with boiled linseed oil and turpentine to render it as gas proof as possible. The cover was in this way rendered very heavy and the durability of the material was greatly lessened. The practice of treating the tent as above has now been discontinued in California, but 8 oz. duck is still said to be used almost exclusively, being thoroughly shrunk and frequently treated with tannin to prevent rot, but with nothing added to render it more gas-proof. In Cape Colony a duck of 12 oz. or upwards is recommended by the Government Entomologist, the smaller the cover the heavier the cloth owing to the leakage surface being so much greater

in proportion to the cubic contents when a smaller space is enclosed. No. 10 Yarmouth, a Canadian duck, of over 12 oz. weight, is used by at least one firm in Capetown. Some of the makers, however, seem to have gone back to using 10 oz. duck in their covers. In Florida, Mr. A. W. Morrill, who has been conducting experiments with fumigation against the White Fly (*Aleyrodes citri*), states that 6½ oz. drill appears to be as effective as the 8 oz. duck used in California and not so expensive. We are not very favourably impressed by the samples of 10 oz. duck as used latterly by some firms in making fumigation covers in Capetown, and prefer the heavier, dearer and better grade known as N Birkmyre. Those in Rhodesia investing in fumigation covers should send for samples and judge for themselves, the aim being to get a cloth as light and cheap as is consistent with ability to hold the gas for a reasonable time. In general one should not be able to see interstices in the cloth when it is held up to the light.

Through the courtesy of Mr. R. McIlwaine, who recently imported a number of tents and sheets from England, we are enabled to give certain particulars about the materials and cost of covers as obtainable there. The aim, already mentioned, in choosing material for a cover being to obtain a duck as light and cheap as is consistent with ability to hold the gas for a reasonable time, examination of a number of samples from different firms reduced the choice to two qualities manufactured by Sir Elkanah Armitage & Sons, Ltd., of Manchester. The one is a 9 oz. duck known as No. 470, which is remarkably free from interstices for a cloth of this weight, being freer in this respect than some 12 oz. samples we have seen. The price is 1/6 per yard 72 inches wide. The other, which was eventually chosen, is a 10 oz. duck known as No. 01943 selling at 1/7¾ per yard. A London firm, Mr. Thomas Briggs, Queen Victoria Street, quoted an all round price of 4/6 each for making up the bell tents and 2d. per foot for making the sheets, a 36 foot sheet thus costing 6/- for making and so on. There is some doubt as to whether they would be able to quote at the same price again. The price for the tents in England thus ranged from 15/6 for No. 1 to about £3 3s. 9d. for No. 5; a 72 foot sheet cost £20 7s. 0d., whilst a 36 foot sheet cost £5 4s. 11d. We may say that we have seen the

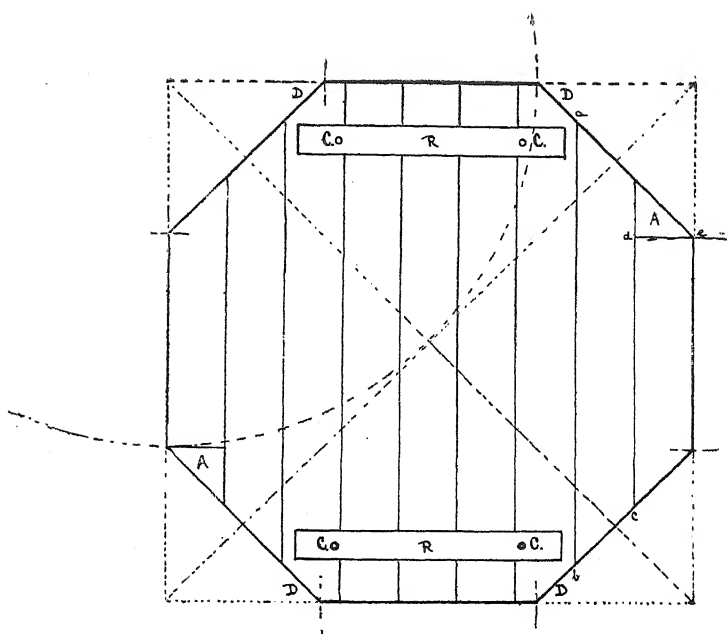


Fig. I.

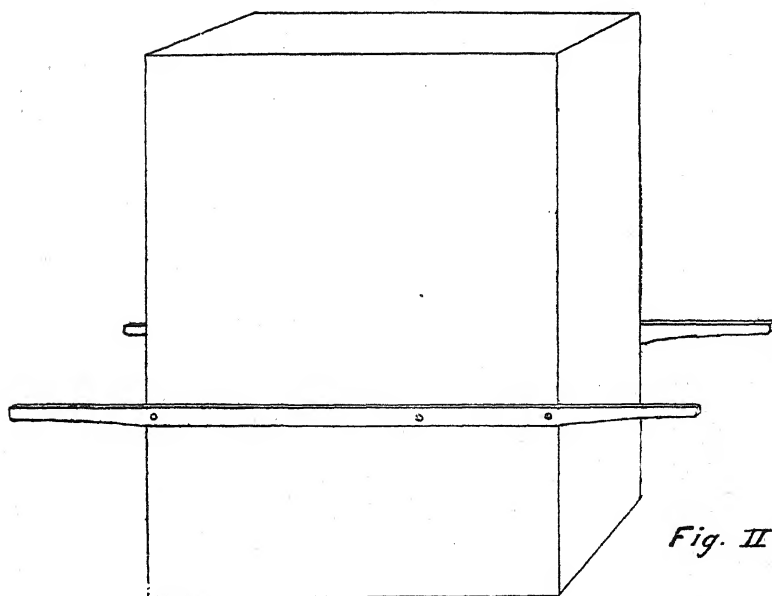


Fig. II.

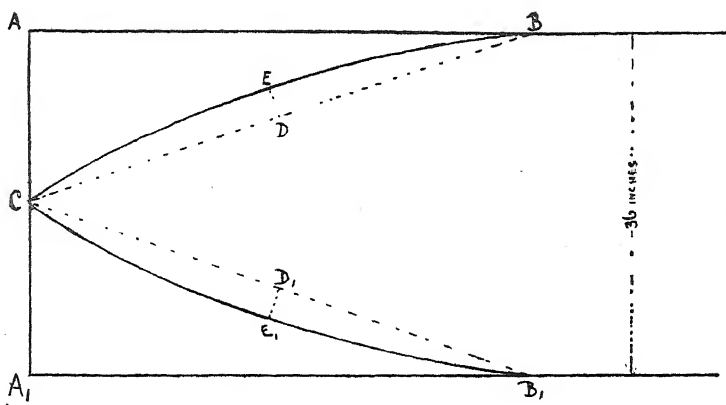


Fig. I

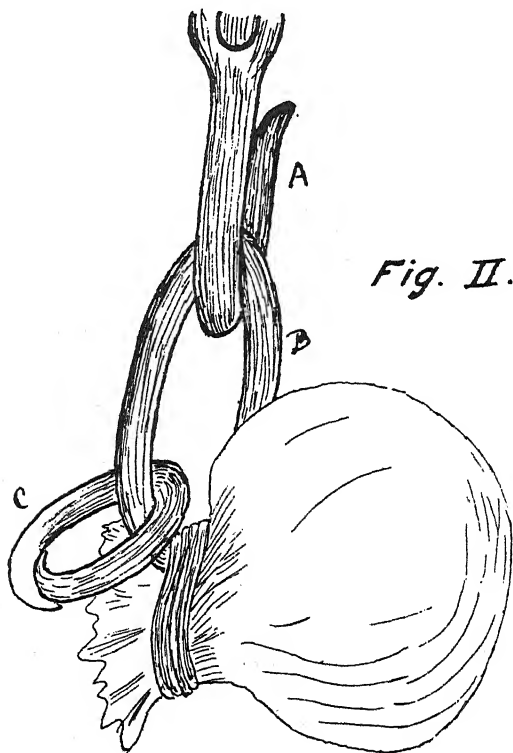


Fig. II.



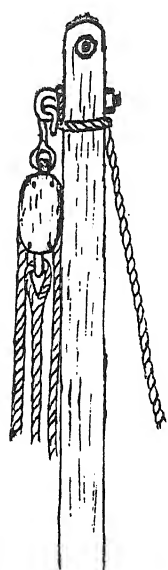


Fig. I.

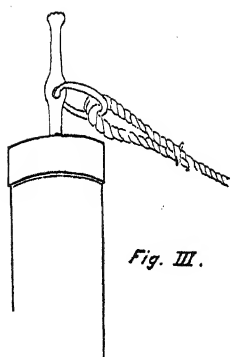


Fig. III.

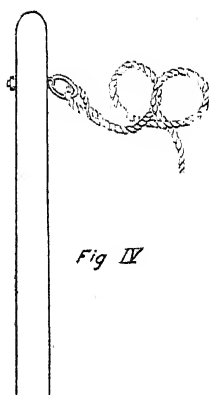


Fig. IV.

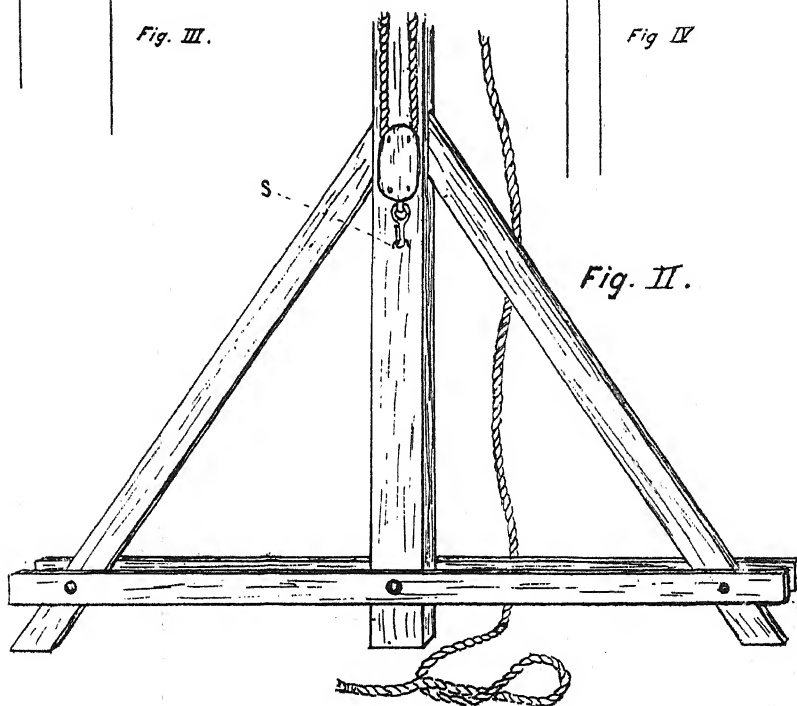
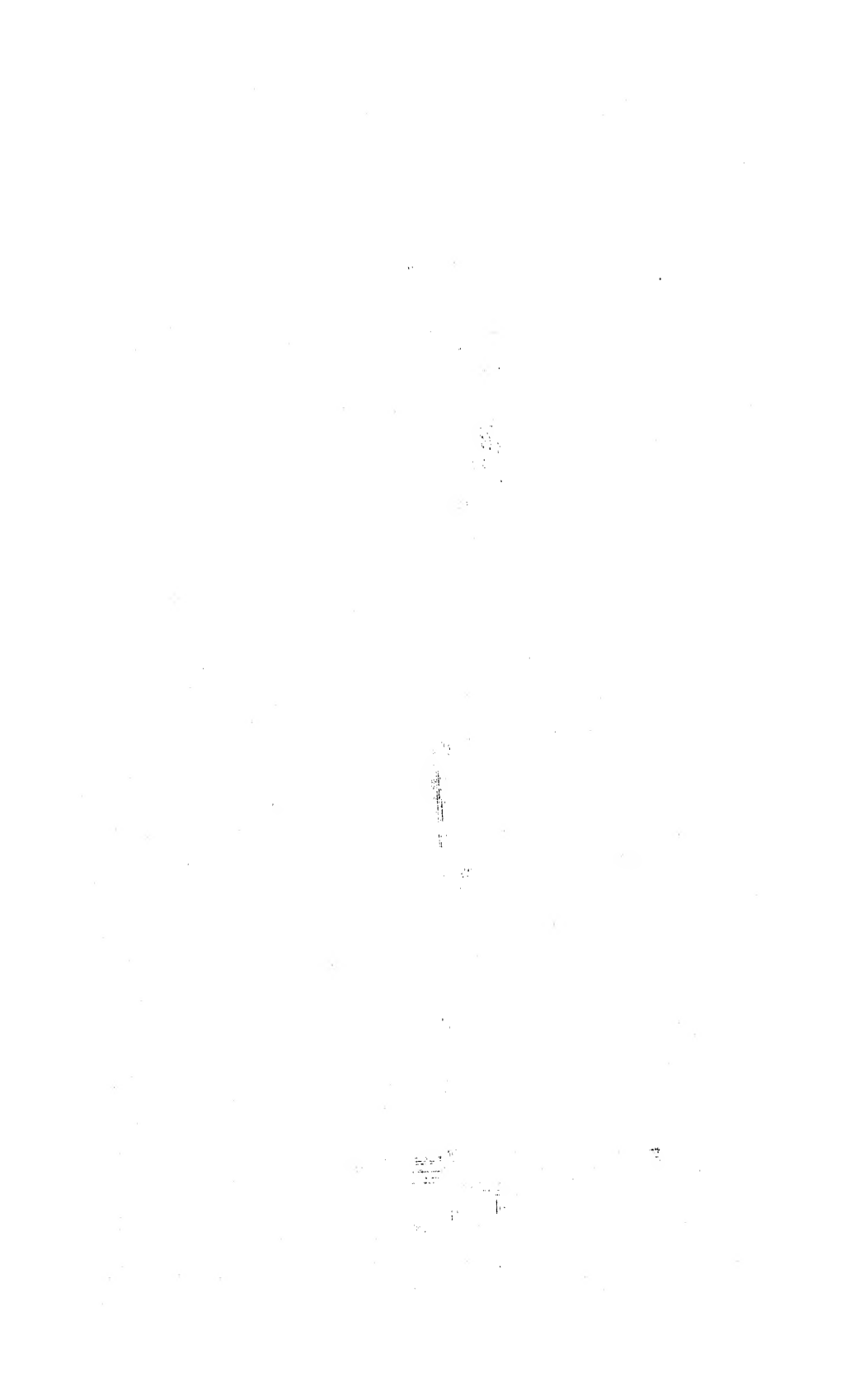


Fig. II.



samples and the made up covers mentioned here, and we can recommend either No. 470 or No. 01943 for fumigation purposes.

Box covers may be made with calico or some such light material as owing to the fact that they do not need to be made to stand folding, etc., they can without deterioration be rendered very nearly gas tight by the use of paint or varnish.

Covers for fumigation purposes come under three headings, namely sheet covers, tent covers and box covers, and are generally applicable to trees of descending size in order named.

Sheet covers are made in the form of a regular octagon and are quite flat. Plate I, fig. 1, shows diagrammatically the method of making one of these covers. The cloth is best obtained of the 72 inch width to avoid having to make more seams than is necessary. The diagram shows a 54 foot sheet made of this width of cloth. As each seam takes up half an inch, the sheet will be four inches narrower than the normal width. In cutting, waste is avoided as follows:—The pieces for the middle, which is about five-twelfths as wide as the full width of the sheet, are first cut, and if necessary the corners cut at an angle of 45 deg. as in the diagram (DD). As the greatest strain falls on this part it is well to have these pieces entire so as to avoid bringing a heavy strain to bear cross wise on a seam. The end of the roll is now placed against the shoulder (a), the end folded over to meet the side, and the triangle is removed by cutting along the crease. A similar fold is made at the other end (b) and cut. The roll is now turned round and the acute angle left by the previous cut is placed in contact with the corner at (c). If this is the last piece as in the illustration the roll is cut off straight across at (d e), a width shorter than the side of the previous piece and the corner filled up with the triangle cut from the first piece (AA). In this way the only pieces of cloth wasted are the small triangles at the side ends of the outside middle pieces if they do not happen to correspond with the corners of the octagon, as at (DD). The amount of cloth required for making an octagonal sheet can be calculated by reckoning the amount required for a square of the same width and subtracting one-sixth. In order to enable the material to withstand the local strain produced by the catch rings (CC), which will

be described later, it is recommended that two reinforcements (RR) be stitched across the middle of the cover about one-tenth of the width from either end and extending a few feet into the sides (see illustration gg). These are conveniently made each of a half width of the material used, and would thus add about 9 yards to the amount of material necessary for making the 54 foot cover. The seams of the sheet should be doubly sewn and a hem run round the raw edges. Thorough shrinkage of the material is necessary to make the cover as gas-tight as possible, and as this cannot as a rule be conveniently done before the cloth is cut, allowance should be made in cutting the cloth if the shortening is likely to affect the utility of the cover. Morrill gives the result of a test with the 8 oz. duck commonly used in California, stating that the shrinkage lengthways amounted to 7.5 per cent. and that crosswise to only .9 per cent. Assuming that these figures will apply approximately to heavier duck, it will be seen that unless due allowance is made a cover after shrinking will depart somewhat from the regular octagon form, the shrinkage lengthways of the strips being eight and a third times as much as that sideways. At the shrinkage given, a 54 foot sheet would shorten one way by over four feet and the other way by less than six inches. To obviate this the lengths may be cut about 6.5 per cent. longer than the sheet is to be after shrinkage, and thus the total amount of 72 inch cloth required for a 54 foot sheet will be about 153 yards.

In deciding the size of cover required, the highest tree to be fumigated should be measured, and the width of the sheet should not be less than two and a half times this measurement.

It is obvious that a large sheet cannot be placed over a twenty foot tree without some mechanical assistance. The sheets are therefore handled with changing poles or derricks according to their size. The simple poles are in general used for sheets under about 45 feet and derricks for those larger. In the latter case catch rings are provided on the sheet to take the hook of the pulley block. These catching places have already been alluded to in connection with the strips of cloth for reinforcing the sheet. One of these catching places is illustrated at Plate 1, fig. 2. The cloth is gathered round a

wad of some soft substance and bound as shewn with strong cord which also passes through the catch ring. The little ring shewn in the illustration is known as the "jangler," its purpose is to indicate the position of the catch ring when the cloth is shaken, fumigation operations being performed mostly at night. The rings are to be situated on the reinforcement strips provided, and each should be about one-third the width of the cover from the parallel sides and from each other. It is well to provide catch places at each end as shewn, although only one pair is used at a time.

Derricks for handling the larger sheets are generally 25 feet or upwards in length. Two are used to handle a sheet. They should be about the same height as the largest trees to be covered. They are usually made of squared wood, straight grained and without knots. Pitch pine is commonly used in the Cape Colony for this purpose. At the base the upright may be 4 by $2\frac{1}{2}$ inches and should taper somewhat towards the top. There is no reason why rough round poles should not be used if they are available and strong enough. They may taper from 3 to 4 inches at the base to 2 to 3 inches at the top. The top of the upright is provided with a pulley block as shown in Plate 2, fig. 1, a ringed bolt to hold it being driven through the wood. To avoid splitting a second bolt of the common form may be driven through at right angles rather higher up and screwed tight. A guy rope is also attached for the purpose of steadying and manipulating the upright during the operations. The ropes throughout should be five eighths of an inch in diameter. That which goes round the pulleys will need to be rather less than three times the length of the pole, whilst the guy rope should be a few feet over the length of the pole. The base of the upright is furnished with cross-pieces as at Plate 2 fig. 2. This is to keep the line of movement more or less in one plane when the strain is on the poles. A staple (S) may conveniently be driven into the pole a few feet from the foot to take the hook of the lower block when the derricks are out of use.

In handling a large sheet the derricks are raised to an upright position one on each side of the tree to be covered, the cross pieces at the base of each being in a line with one another. The lower block of each derrick is hooked into

the corresponding catch ring on the sheet, and both sides are hoisted simultaneously, the uprights being supported by the guy ropes. When hoisted sufficiently high the poles are pulled forward by the guy ropes carrying the edge of the sheet over the tree between them and down to the ground on the other side, the tree being thus entirely enveloped. It thus takes four men to handle a large sheet with derricks, one at each pulley rope for hoisting and one at each guy rope. The poles come down slowly owing to the friction of the sheet on the branches of the tree (Plates 3 and 4).

The changing poles used in handling the smaller sheets vary from 12 to 20 feet in length, are generally 2 to 2½ inches in diameter and may be fitted in various ways for use with catch rings. Strong bamboos suggest themselves as very suitable. Plate 2, fig. 3, is a device given by Lounsbury. The point B is for insertion into the catch ring, and the ring C the attachment for the guy rope. Another form has the end merely tapered to allow of its insertion into the ring, and this is an easy form to make at home. Morrill, however, recommends the handling of the smaller sheets without catch rings at all, the pole being rounded at the end and the sheet secured to it by the well known half-hitch knot being made in the guy rope and slipped over (Plate 2, fig. 4). The writer has not seen this method in practice, but it recommends itself by its simplicity. The base of the changing pole is brought to a point to prevent slipping, and for durability may be shod with iron.

In operating a small sheet the poles are attached by one of the methods mentioned above and their bases placed on either side of the tree to be covered. The tops of the poles are then raised until the pointed bases will take a grip of the ground, and then by pulling on the guy ropes as with the derricks the edge of the sheet is carried over and the tree covered. Two men are sufficient to handle sheets suitable for operation with changing poles.

In pulling a sheet on or off a tree care should always be taken that the pull is in a line with the length of the strips of cloth of which the sheet is composed. In this way there will be less likelihood of tearing than if the branches drag across the seams, and the general wear will be lessened.

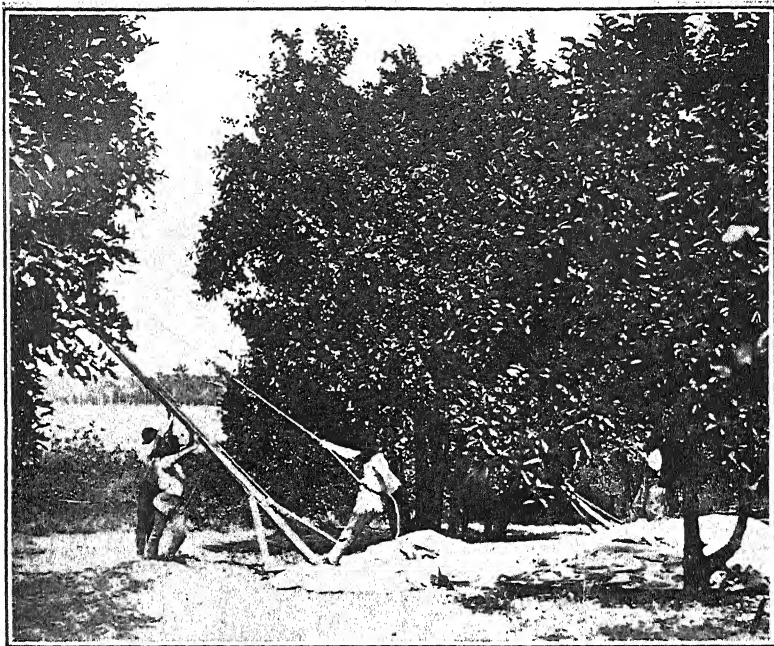


Plate III. Fig. I.

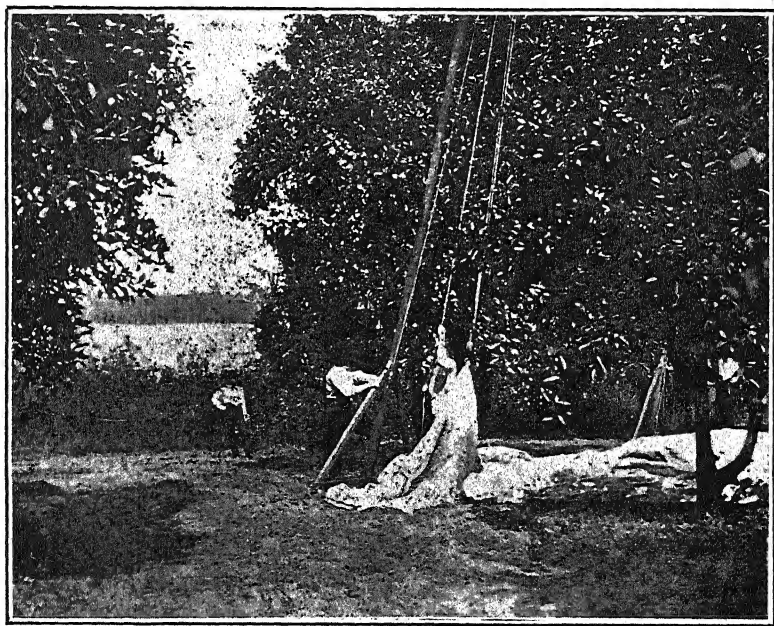


Plate III. Fig. II.

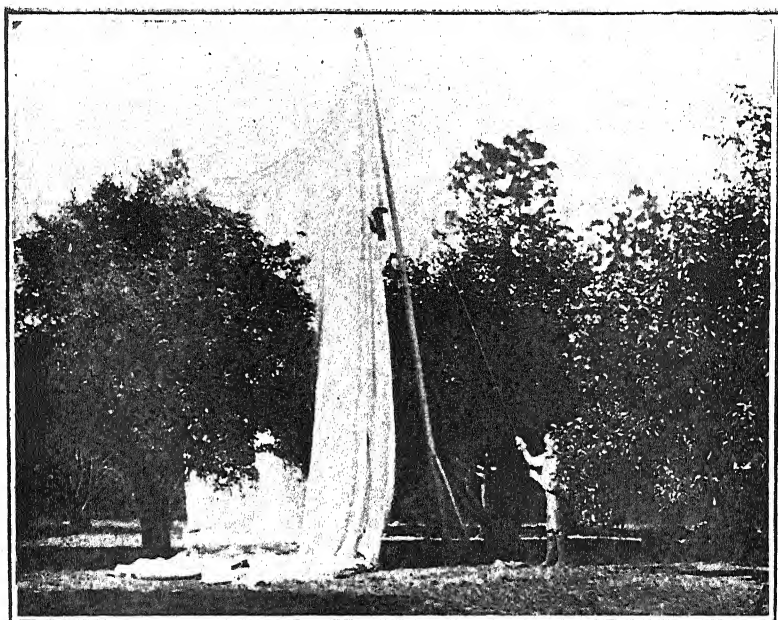


Plate IV. Fig. I.

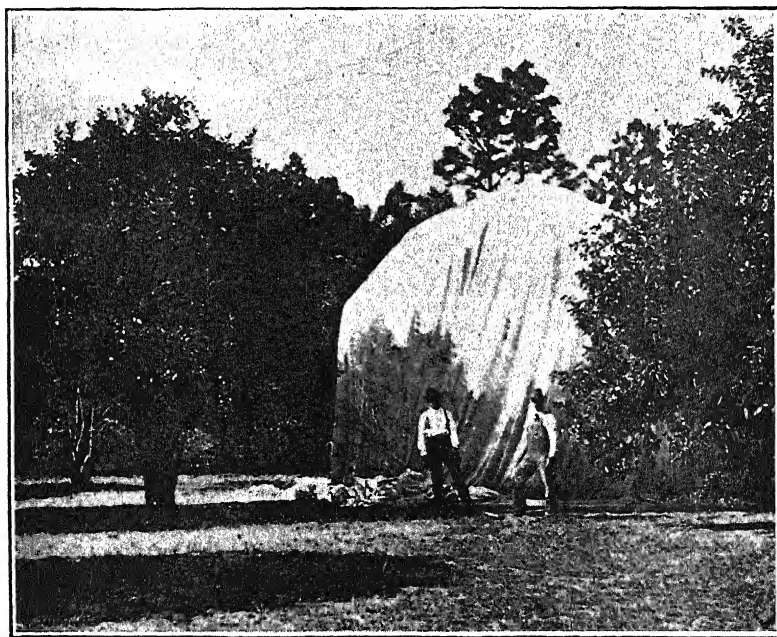
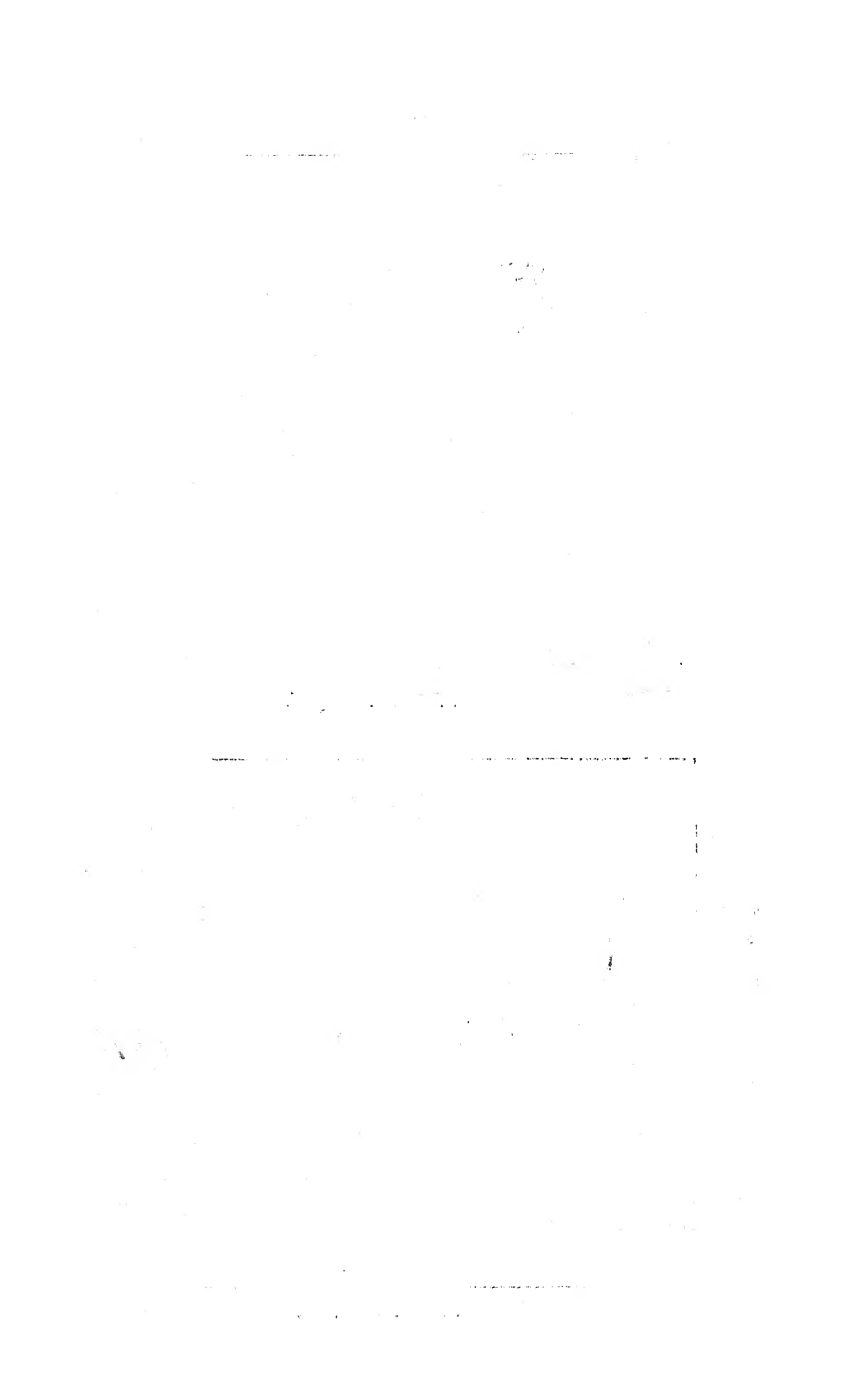


Plate IV. Fig. II.



The next type of cover to be considered is the bell-shaped hoop tent. The pattern is popular and is to be recommended for trees twelve foot high and under. It is more economical than the sheet as regards material, and quicker to handle. The method for cutting the strips for the bell tent is described by Lounsbury, to whom the sketch at Plate 5, fig. 1 is due. Seventy-two-inch widths are used, and for the purposes of cutting are folded double to be 36 inches wide. A.B. is one fourth of circumference of the completed tent, C. is the middle point between A.A., the point D. is midway between A. and B., and D.E. is a normal four inches long. The arc C.E.B. gives the correct curve. Stout board shapes are usually used in cutting, a knife being run round the edge. The apex of the tent where the different pieces join should be reinforced with a patch of cloth on either side, as this forms a weak spot. Tents in general are not subjected to such heavy strains as sheets, and a single row of stitching is considered sufficient for the seams. Lounsbury gives the following sizes of the bell tents used in South Africa :—

Size.	No. of widths of 6 ft. cloth.	Lengths of strips in feet.	Size of trees covered.
1	2½	8	Under 5 feet
2	3½	10	6½ „
3	4½	13	9 „
4	5½	16	12 „
5	6	18	13 „

To enable operators to handle bell tents successfully the bottom is provided with a hoop of gas piping from ¼ to ¾ inch diameter, according to the size of the tent. This hoop is held in position by a number of strong straps of the cloth or some stronger material sewn round the tent about a foot from the bottom edge. The hoop itself consists of two semi-circles, one of which fits into sockets at each end of the other, and is secured by loosely fitting bolts.

By means of the hoop tents can be placed over the trees and removed very easily by two men, one holding the hoop on either side.

The third type of cover to be considered is the box cover. The principle of this is a light wooden frame across which is stretched strong calico, painted or otherwise treated to render it gas-tight. There is no doubt that this form of cover has many advantages over sheets and tents. It can be conveniently rendered more gas-tight, it does not rest on the tree itself so that danger of mechanical injury to the tree is lessened, the capacity being uniform the dosage can be very easily reckoned and the chance of injury from an overdose is thus decreased, and in general more uniform results can be obtained by an inexperienced operator. Box covers are, however, inelastic, rather cumbersome to handle if of any size and are not applicable to large trees on account of their weight and awkwardness. For very small trees and plants in nursery rows they are to be recommended in preference to sheets and tents, as the difficulty of estimating the correct dosage with the latter when covering small trees is considerable, and the damage likely to be caused by an overdose increases as the cubic content of the cover decreases. Box covers are also suitable for fumigating deciduous trees which do not lend themselves so easily as citrus trees to supporting a sheet or tent, owing to the lesser elasticity of their branches.

Any man who owns an orchard should be able to design a box cover to suit his own requirements. A framework of light timber measured to enclose the largest tree on which he wishes to use it, the tacking on of the calico, and the painting or varnishing to render it gas-tight, present no difficulties. A piece of small timber may be conveniently fastened along each side and the ends shaped off to act as handles with which the cover may be lifted from tree to tree by four men. A sketch of such a box cover is shown at Plate 5, fig. 2. It is also of advantage to have a fringe of the material about a foot wide projecting at the bottom. Earth can be shovelled on to this when the cover is charged and will prevent leakage

of gas at the point of contact with the earth, and will also help to keep the cover steady in the event of a sudden gust of wind.

For the fumigation of plants in nursery rows a box cover may well be made to cover several rows at a time, and to extend about 9 feet along the row, being high enough to clear all but the highest trees which can be bent to come under the cover in use. If a sheet only is used on the premises, this may be placed across a suitable framework, but this naturally takes more time in changing position and is rather troublesome to work with. With these broad shallow covers it is as well to place half the charge under each end so as to obtain a better distribution of the gas. A mechanical agitator in the form of a fan would also be an advantage and would not be difficult to design. The agitator should only be worked for a few minutes after the charge is inserted.

The cheapest method of generating Hydrocyanic Acid Gas is the treatment of Potassium or Sodium Cyanide with dilute Sulphuric Acid. The proportions usually considered most economical are one ounce by weight of Potassium cyanide, one ounce by measure of Sulphuric Acid and two ounces by measure of water. If Sodium cyanide is used, about $\frac{3}{4}$ of an ounce is used instead of one ounce of Potassium cyanide. Potassium cyanide can be obtained in Salisbury in 14lb. tins at $1\frac{1}{3}$ per lb.; Sodium cyanide in 2 cwt. casks at 9d. to 10d. per lb.; Commercial Sulphuric Acid costs $37\frac{6}{6}$ per two gallon jar or $12\frac{6}{6}$ per Winchester Quart. A generating vessel will be required and must not be of any metal that is attacked by the acid. Perhaps the most convenient of all are common china pudding basins of the round form, such as can be procured at any store. These have the advantage from their rounded form that a little liquid will cover its corresponding quantity of cyanide effectively, which may not be the case with dishes of a flatter shape. Enamelled dishes should be avoided as the enamel soon cracks and gives the acid access to the metal, which is quickly eaten through. In order to minimise splashing, the vessel should have a capacity at least twice that of the

amount of liquid it is to contain. A pair of scales will be needed for weighing the cyanide and a graded glass for measuring the acid and the water. Measure glasses of one pint capacity graduated into ounces can be procured from most chemists, and several should be kept on hand as they very easily get broken. As the operations are usually carried out at night it is as well to have a box with rough partitions to take the chemicals, the measure glass, the scales and the weights, so that everything is ready to hand. Other accessories such as lanterns, spades, etc., will be needed, but experience will quickly enable the operator to provide for what is necessary in this connection.

The main difficulty in fumigation is in judging the correct charge to give the tree. This is chiefly on account of the irregular shape of the sheets and tents when enclosing a tree, making the estimation of the cubic contents no easy matter. This difficulty is not experienced with box covers of fixed dimensions. Another difficulty lies in the varying ratio of the leakage surface to the cubic contents according to the size of the tree. In order to guide the fumigator in regard to dosage, numerous tables have been prepared by various experimenters. Most of these have depended upon a knowledge of the height and diameter of the tree to be fumigated, and have been admittedly only very approximate. The aim in fumigating for scale insects should be to use such a charge that a little injury to the tenderest shoots on the tree is the result. This injury is quickly outgrown by the tree and is an excellent index that the charge is strong enough to kill the scale. Morrill in his recent publication on Fumigation for the Citrus White Fly in Florida, gives a table based on a knowledge of the circumference of the tented tree and the distance from ground to ground over the top. The writer is more familiar with a table based on the height and diameter of the tree, but is ready to acknowledge that Morrill's method of measurement should give more accurate results. Morrill facilitates the taking of the measurement over the tree by painting straight lines across his sheets, one lengthwise of the strips and meeting the ends of the sheet at their mid points, and a similar one at right angles meeting the sides at their

mid points. With large sheets he has a supplementary line on either side of the first one and parallel to it at a distance of a few feet. These lines are marked in feet at a corresponding distance from the centre of the sheet where the two main lines cross, the supplementary lines being measured from where they cross the line at right angles to them. It is not necessary to begin the numbering right from the centre, allowance being made for the smallest trees over which the sheet will be used. The numbers with sheets may begin at about 12 feet from the centre. With bell tents a single line in the form of a diameter marked as described above is a great assistance in estimating dosage. Failing the measurements on the tent itself a long tape must be used, the reel being thrown over the top of the tent in order to obtain the distance from ground to ground. The measurement of the circumference of the tent is made with the tape in any case. Tents marked after the Morrill system have now come into use in California.

Morrill states that the doses necessary for the destruction of white fly are greater than those necessary for the destruction of most scale insects. As the aim in South Africa has always been to give the tree as large a dose as it will stand without suffering material injury, his table should be useful under our conditions, but for the fact that it is computed for use with tents of 8 oz. duck only, and the quantities of chemicals which he gives are far in excess of those generally used in South Africa. The same holds good of the doses recommended for scale in California. The writer is therefore compelled to abandon any idea of using these recent tables in this article and reproduces here the one with which he is familiar, namely that given by Mr. Chas. P. Lounsbury in his pamphlet entitled "Cyanide Gas Remedy for Scale Insects," Capetown, 1902. This table is based upon the measurement of the height and diameter of the tree and is given in its entirety with the addition of two columns giving the approximate corresponding measurements over and around the tree.

TABLE OF DOSAGE FOR TENTED TREES.

Measure- ment over Tent.	Circum- ference of Tent.	Height of Tree.	Diam- eter of Tree.	Water	Acid.	Potas- sium Cyanide.	Space enclosed.
feet	feet	feet	feet	fl. oz.	fl. oz.	oz.	Cubic feet
9½	9½	4	3	½	½	¼	25
14½	12½	6	4	1	½	½	65
15½	19	6	6	2	1	1	140
19½	19	8	6	3	1½	1½	200
24½	25	10	8	5	2½	2½	435
28½	25	12	8	6	3	3	535
30	31½	12	10	7	3½	3½	815
34	31½	14	10	8	4	4	970
35	38	14	12	10	5	5	1355
39	38	16	12	12	6	6	1585
40	44	16	14	15	7½	7½	2105
44	44	18	14	16	8	8	2415
45	50	18	16	20	10	10	3085
49	50	20	16	22	11	11	3485
50½	56½	20	18	26	13	13	4325
54½	56½	22	18	30	15	15	4835
59½	63	24	20	40	20	20	6500

To the practical orchardist the first consideration is that of initial cost and maintenance, in order that he may be able to judge whether this remedy is going to pay him better than spraying. It is therefore very desirable to give a rough idea of the cost of outfits in Rhodesia. Owing to the very high wages paid to skilled workmen in the Rhodesian towns, it will be cheaper to procure covers from Capetown, where several firms make a speciality of them and keep a stock on hand, or from England. The Gourrock Ropework Export Company and Messrs. Alex. Cameron & Co. are amongst the chief of the Capetown firms, and will furnish quotations on application. Tent covers in the five sizes mentioned range from about £1 10s. to £7 each. Sheet covers from 33 feet to 54 feet range from £7 10s. to £19 each. All of these are of ten ounce duck. If the N Birkmyre cloth is used the prices are rather higher. Railage from Capetown to Salisbury on this class of goods costs 23/4 per 100 lbs. The weight can be worked out roughly from the yardage of cloth used.

It is difficult to give an accurate idea on paper of the cost of an outfit to suit an orchard of a given size as so much depends on the height of the trees. The orchardist can however work out his requirements for himself on the basis that one cover can be used to cover eight trees in a night or four working up till midnight as is generally preferred. The fumigation operations should be carried out on the whole orchard within a reasonably short period say six weeks. Working five nights a week and four hours a night one cover will in this time fumigate 120 trees.

To take a specific instance and to compare with the next most effective remedy known for scale insects on citrus trees, namely, spraying with Resin Wash, we may consider an orchard of 500 trees, and as orchards in general are not very old in Rhodesia we may take the average height as 12 feet. Probably many trees will be below this height and some above. At least four covers averaging about £6 10s. each landed in Salisbury will be required, which gives an initial outlay of about £26. A spray pump sufficient for 500 trees of this average size will cost about £12 landed and mounted ready for use. In the initial outlay outlay fumigation is thus considerably more costly than spraying. In operation, however, it is a good deal cheaper the cost for chemicals being $8\frac{1}{2}$ d. per tree as against $\frac{1}{3}$ or more for two sprayings with Resin Wash. It must be borne in mind also that the two sprayings will not be as effective in killing the scale as one fumigation properly carried out, so that respraying will be necessary before a second fumigation, providing there are no gross sources of reinfestation close at hand. The orchard of 500 trees, exclusive of the initial outlay and the labour, will cost about £17 15s. to fumigate effectively and over £31 to spray less effectively. Thus in one year over £14 should be saved and this will just about cancel the difference in initial outlay. Fumigation also does not require the labour, the heat and the vessels necessary for making Resin Wash, and if the initial expenditure can be faced, will in the end be found much the more economical of the two for an orchard of commercial size, always provided that the covers are well looked after and not allowed to get spoiled either in working or storing them. Even for small orchards down to 100 trees, providing they

are fairly uniform in height, the fumigation process will really pay better than spraying, as any sort of barrel pump will cost £7—£8 mounted in Salisbury, and the cost for say two covers will not be more than twice as much.

It will not be out of place to add here that it is possible that certain miscible oils, which are recommended for spraying citrus trees for scale at a cost of 2½d.—3d. per gallon in Rhodesia may prove as effective as Resin Wash, and though they cost rather more they have the very considerable advantage of not needing the labour and trouble of preparation that is really a serious drawback with Resin Wash. These oils will be tested by us shortly and the result given to the public in these pages.

The sheet cover, tent or box cover being in position over the tree and a few shovels of earth thrown over the lower edge, everything is in order for the insertion of the charge. The generating vessel containing the measured quantity of water should be placed under a lifted flap of the tent and well away from the side in order that a chance splashing later may not injure the cover. The acid may be added from the measure itself. The acid should always be added to the water, not vice versa, as in the latter case splashing is apt to result, the heavier acid being imprisoned below the lighter water, whilst violent union of the two is taking place. The mixture will at once become very hot. The weighed quantity of cyanide should then be slipped into the mixture, the operator at once withdrawing and dropping the flap of the tent, upon which a few shovelfulls of earth are thrown, and the tent is charged. A shovel of paper may conveniently be used for slipping in the cyanide. The cyanide should not be weighed directly on the metal plate of a scale, which it would have a tendency to attack, but on a piece of paper laid on the plate. Another method is to place the cyanide and water in the generating vessel before placing it under the tent. The acid is then added.

The water and cyanide should not be allowed to remain together too long, as if there is much of the latter in solution when the acid is added, the evolution of gas is likely to be so energetic and sudden that violent splashing is the result, with consequent damage to the cover and foliage near by, and perhaps the hands of the operator. For the same reason the

cyanide should not be in a powdery state. Pieces about the size of a lump of sugar are suitable.

The full effect of the charge is considered to be dissipated after 40 minutes when unpainted 8 oz. duck is used, but with the heavier ducks it is probable that the gas is held longer. Forty-five minutes may in general be allowed for the destruction of the scale. The cover can then be removed and will be found to contain very little gas, and as that mixes at once with the air, there is no danger of unpleasant effects to the operator. Sheet covers are generally, if the trees are close enough, drawn direct from one tree to the the next by means of the derricks or changing poles and their guy ropes. If the generating vessel contains undissolved lumps of cyanide when the sheet is removed, it is a sign that the tree has not received the full charge of the gas intended for it, and the operation may have to be repeated. Too little acid is the most obvious cause for this failure of a complete reaction, but if the quantities were correctly measured it may be due to the cyanide being in too large lumps, or the acid and water mixture having been allowed to get too cold before the cyanide was added. Remains of undissolved cyanide are usually charred black.

Fumigation should always be carried out in the absence of direct sunlight. On a dull day or very early in the morning or late in the evening a private owner can with advantage fumigate a few trees, but the operations are generally done at night. If a citrus tree is left covered with a more or less airtight cover for so long a period as 45 minutes in bright sunlight, serious injury to the foliage is likely to follow. This is especially the case with oiled covers. Conditions that should be avoided are wetness of the foliage with rain or dew, the prevalence of high or even moderately high winds and the presence of much blossom on the trees. There is more danger of injury to foliage when there is a great amount of young growth than when the trees are more or less dormant. Dead wood is apt to tear sheet covers and should be removed where practicable.

Most of the covers used in South Africa are untreated to prevent rot and therefore they require the greatest attention as to being thoroughly dry before they are packed away. To effect this they should be exposed open to the sun for several

hours. A sheet can be hauled partly over two trees to dry, and a tent should be propped open by some handy means and raised from the ground to allow the air free play beneath. The covers should, of course, be kept in a dry place and where they are not subject to the attacks of rats or mice. If packed away for any length of time they should occasionally be taken out and overhauled.

The cyanide will deteriorate with exposure to the air and should therefore be kept in an airtight tin. The lever top pattern of tin is very convenient for this purpose. Sulphuric acid deteriorates in the same way and in small quantities should be kept in a glass stoppered bottle. The two gallon jars in which the chemical is supplied are in general furnished with screw stoppers and make excellent receptacles for storing it.

In spite of the fact that not a single fatality has been recorded in any part of the world from the use of cyanide for orchard fumigation, it cannot be too strongly urged upon the general public that the greatest care is necessary in handling such a poisonous chemical. The introduction into the system of such a small quantity of Potassium cyanide as $2\frac{1}{2}$ grains is liable to be followed by death, whilst a lesser quantity will certainly cause severe if temporary sickness. In the field there is practically no likelihood of being overcome by the gas unless a man were to stay or keep his head inside the tent after charging it. The presence of the open air surrounding the tent is the greatest safeguard. Hydrocyanic Acid Gas acts on the heart and it is perhaps desirable that those suffering from weakness of that organ should not engage in fumigation operations.

Sulphuric acid is, of course, a deadly poison if taken internally. It is also highly corrosive and should be washed from hands or clothes immediately if it accidentally comes into contact with them. The promptest washing will however probably fail to save the clothes from being burnt into holes at the points of contact. It will burn through leather in the same way as the ruination of boots and gaiters will speedily testify, if they are allowed to get splashed with the liquid.

By far the commonest and most destructive pest of citrus trees in this territory is the Red Scale (*Chrysomphalus aurantii*). This scale is, as seen on the trees, approximately circular, nearly flat, and the largest specimens, which are the adult females, are up to about two millimetres or rather under one sixteenth of an inch in diameter. The colour is reddish, hence the common name. The smaller scales cover the young larvae and pupae. The actual scale is only the covering, a waxy substance secreted by the minute insect which lies beneath and sucks the juices from the tissues on which it lives. Male scale insects are tiny two-winged creatures, never noticed by anyone—not an entomologist. They are quite harmless to vegetation. The Red Scale is a very serious pest in practically all the citrus growing countries of the world. Besides the damage it does by sucking the juices from the plant it is supposed to excrete something poisonous to the branch on which it rests, and thus to hasten its death. If the skin be cut from a pear twig beneath one of these scales the whole will be seen to be coloured red, presumably by the action of the poison spoken of above. Besides citrus trees, Red Scale infests apple, pear, fig, oak, willow, rose and a variety of garden plants.

A close relation to the Red Scale is the Oleander Scale (*Chrysomphalus hederæ*), which is often injurious to citrus trees in Rhodesia. It is similar to the Red Scale except that it is light grey instead of being red. This is the scale which so constantly whitens the trunks of Syringa trees. Its attacks on citrus trees are curiously uncertain. Sometimes a lemon tree will be smothered with it, but lemon trees frequently grow side by side with badly infected Syringa and other trees and do not seem to become infested at all. As a pest it ranks far behind the Red Scale. Oleander Scale also attacks oleander, mulberry, fig, black wattle, honeysuckle, American aloe (badly), Cape gooseberry and a large number of other garden plants. It is one of the commonest garden scales in the territory.

Another destructive scale almost as common on citrus trees as the Red Scale, is that known as the Brown or Soft Scale (*Lecanium hesperidum*). This is one of the naked scales, the scale being the dorsal surface of the insect itself without any protective covering of wax. The female insect measures

when mature about 2 to $2\frac{1}{2}$ millimeters long by $1\frac{1}{2}$ to 2 millimeters wide. Its colour is brown. The Soft Scale secretes a considerable amount of sweet liquid known as honey-dew, which drops freely on to the foliage below the scale. On this almost invariably grows a black species of fungus (*Fumago* sp.), which causes a conspicuous blackening of the foliage in the vicinity of the scale, and renders its attack rather conspicuous. (Honey-dew similarly accompanies the presence of the Black Citrus Aphis.) Ants are very fond of the sweet liquid, and may be seen swarming about the infested trees. They are supposed to protect and care for the scale on this account, and to destroy some of the beneficial insects which prey on it. This scale infests the younger branches and leaves of the trees, and except, perhaps, on very young trees, it does not equal the Red Scale in destructiveness. The Soft Scale attacks a very wide variety of plants. It is common on rose trees in the territory, and on Blackwood. Camellias are a favourite food plant, those imported from Europe being frequently infested with it. It also thrives on mango in Salisbury. Quince, guava, fig, and a host of other food plants, are recorded for it.

Next may be mentioned the Purple or Mussel Scale (*Lepidosaphes beckii*). Until recently the writer was unaware of the occurrence of this pest within the borders of the territory, although well aware of its abundance in Natal and its occurrence in other parts of South Africa, where it is by no means generally distributed. Recently, however, specimens have been sent from Umtali and the infestation reported appeared to be a very severe one, showing that the pest will thrive at least under the conditions prevailing in that town. This scale is shaped something like the mussel common on European and other coasts. The length of the female scale is rather under one sixteenth of an inch. The colour is usually deep brown, not purple as the name indicates. The purple scale is very destructive indeed under conditions which suit it, and it is one of the most difficult scales to kill, needing a dose of "gas" as strong as the tree will stand, which may often be repeated after an interval of about three months with advantage. (Less in the hot weather and longer in the cold). The cause of the resistance of this scale to fumigation is that the eggs, which are concealed under the scale of the

female, are so protected that the gas fails to obtain complete access to all of them, and so some escape being killed. The second treatment should kill the scale which hatch from these eggs before they lay eggs themselves. Purple Scale, though not absolutely, is mainly confined to citrus trees. It attacks certain orchids in addition.

A close relation to the Red Scale, namely, the Circular Purple Scale (*Chrysomphalus ficus*), occurs also in the territory and though of little importance at present, it may be a factor to contend with at a future date. The female scale is circular and the colour is dark brown or purplish with a central orange coloured spot. It is about the same size as the Red Scale. I have seen it on palms in a greenhouse in Bulawayo very abundantly. It is also known to occur on orange trees near Salisbury. In addition to these it attacks several garden plants.

If dealing with the Red Scale one fumigation correctly carried out should practically exterminate the pest on the tree, fumigation having this great advantage over spraying that the gas fills all the area enclosed by the tent and not taken up by the tree, so that with the right dose thorough work is ensured, whereas the most thorough spraying by practised workmen will fail to reach all the scale. With good work then the time that will elapse before it becomes necessary to repeat the dose depends upon the sources of infection near the trees. Firstly it will be readily seen how necessary it is to go straight through with the work of fumigation so as to avoid giving the already fumigated trees time to become reinfested from those not yet attended to. Scale spreads by means of the active newly hatched larvae getting from one tree to another through the agency of birds, other insects or the wind. If one tree is producing young scale in abundance and the next one to it is fumigated and no further action taken for several weeks, the fumigated tree may well become infested with young scale and though all the trees in the orchard be finally fumigated, the source of reinfestation is left behind. It must also be borne in mind that many other plants besides citrus trees act as hosts to the Red Scale, the Oleander Scale and the Soft Scale. Some of the other hosts of these are mentioned in the previous division. Trees or plants infested with these scales

should not be tolerated near the citrus orchard. Isolation of the orchard is the best safeguard against reinfestation and gives the fumigation process the maximum effect if thoroughly carried out. An ill-kept orchard adjoining that of the man who fumigates may be the cause of constant expense to the latter.

CONCLUSION.—Fumigation is by far the most effective means known for destroying scale insects on citrus trees. It is safe, and in commercial orchards, economical. The operations can be carried out without danger by any ordinarily careful man. The treatment is unreservedly recommended to all citrus growers, who have sufficient trees to justify the initial expense.

EXPLANATION OF PLATES.

PLATE 1.

- Fig. 1. Plan for construction of Octagonal Sheet.
 „ 2. Catching places on sheets for hooks of Derrick Blocks. (Roughly after Morrill.)

PLATE 2.

- Fig. 1. Top of Derrick Pole.
 „ 2. Base of Derrick Pole.
 „ 3. Top of Changing Pole (after Lounsbury).
 „ 4. Top of Changing Pole, for use with half-hitch in guy rope, shewn.

PLATE 3.

- Fig. 1. Raising Derricks to upright position (after Morrill).
 „ 2. Derricks in position (one on each side of tree), supported by guy ropes. Pulleys hooked to catch rings in tent (after Morrill).

PLATE 4.

- Fig. 1. Front edge of sheet tent raised to tops of Derricks, ready to be pulled over tree (after Morrill).
 „ 2. Sheet tent ready for introduction of chemicals (after Morrill).

PLATE 5.

- Fig. 1. Plan for cutting strips for bell-shaped tent (after Lounsbury).
 „ 2. Box cover.

Suggestions for Cotton Growers.

By R. H. B. DICKSON, Government Agriculturist.

Since 1902, when an attempt was made to corner the American cotton crop, great efforts have been made by the British Cotton Growing Association, supported by the Imperial Government, to find new fields within the Empire where the cultivation of cotton can be profitably carried on. The partial failure of the American crop in 1909, due to a bad season and boll weevil ravages, with a consequent rise in the price of the raw material, has again brought this subject much before the notice of the public, especially as there are some three million people in Great Britain who are more or less dependent for their livelihood on the cotton spinning industry.

The principal countries which are at present producing cotton to any great extent are as follows :—

1. The United States of America, with some thirty-three million acres annually under cotton, produced 3,312,500 tons in 1908, but only slightly over 2½ million tons in 1909: the average yield for the last 10 years being about 185 lbs. lint per acre.
2. India with twenty million acres under cotton in 1909, produced some 900,000 tons, or an average of 89 lbs. lint per acre.
3. Egypt (excluding the Soudan) exported 314,400 tons in 1908. The Egyptian crop has declined both in quality and yield in recent years.
4. China produced roughly 300,000 tons in 1908, of which over 12% was exported to Japan.
5. Brazil produced about 100,000 tons in 1908, most of which was consumed in the country.
6. The West Indies have gradually increased their production since 1903, the date when Sea Island Cotton was re-introduced, up to some 1,200 tons in 1908.
7. Of the British African Territories, Uganda produced about 1,000 tons in 1909, and Lagos 2,500 in 1908, the

latter of rather poor quality, but the former consisting chiefly of American Upland varieties.

It is readily seen that the production of cotton in the United States exceeds that of all the other cotton producing countries combined, and that a very serious problem faces the British manufacturer in view of the increasing tendency in America to build mills, and to manufacture the raw material in those States where cotton is the main crop, thus saving the cost of freight to the Northern States or across the sea to Liverpool.

In 1908, the United States produced $13\frac{1}{4}$ million bales (of 500 lbs.), of which 9 million were exported, leaving $4\frac{1}{4}$ million bales for home consumption, and to be carried forward as stock.

The largest importers of raw cotton in 1908 were:—

Great Britain	...	Importing 3,700,000 bales.
Germany	...	" 2,180,000 "
France	...	" 1,290,000 "
Russia	...	" 1,090,000 "
Italy	...	" 950,000 "
Japan	...	" 890,000 "
Austria-Hungary	...	" 810,000 "

Great Britain requires annually some $3\frac{1}{2}$ million bales of raw cotton, each of 500 lbs. weight, to keep pace with the present demand of the cotton spinners, and of this amount the United States supplies some 80 per cent.

Turning now to the actual production of cotton we shall deal successively with the general requirements of the crop, cultivation, harvesting, preparation for market, varieties and by-products, and finally with the prospect in Southern Rhodesia.

Climate is the essential factor in cotton growing. In the Southern States cotton is usually planted in April or May when there is little fear of further frost, corresponding to October or November in Southern Rhodesia.

The mean monthly, mean maximum and mean minimum temperatures together with the rainfall at 11 stations in the northern portion of the cotton belt of America are given below. These stations are situated in North Carolina, Tennessee, Arkansas and Texas.

	Mean Monthly.	Mean Maximum.	Mean Minimum.	Rain.
April	61.0	72.6	49.8	—
May	69.2	80.1	57.5	3.71
June	76.6	87.2	65.4	3.77
July	79.5	89.9	69.0	3.83
August	77.3	87.0	67.3	3.87
September	71.3	81.3	61.3	3.14
October	61.8	72.0	50.9	—
				<hr/> Total 18.32"

The rainfall varies from 18.32" in the northern to 25.13" in the southern portion of the cotton belt for the 5 months, May to September, which are the most important in the cotton season.

For comparison the same data are given for Salisbury and Gwanda, Southern Rhodesia, for the season October 1908 to May 1909.

The temperature at Victoria is slightly lower than at Gwanda, while the rainfall is practically the same at both stations.

SALISBURY. 4880 feet above sea level.

	Mean Monthly.	Mean Maximum.	Mean Minimum.	Rain.
Oct. 1908	71.9	84.6	59.3	1.74
November	71.5	81.3	61.8	5.62
December	69.5	78.5	60.5	12.67
Jan. 1909	68.8	76.3	61.4	8.54
February	69.3	77.5	61.2	6.16
March	68.3	78.0	58.6	1.71
April	65.4	77.2	53.6	1.59
May	60.3	73.5	47.0	0.03
				<hr/> Total 38.06

GWANDA. 3,000 feet above sea level.

	Mean Monthly.	Mean Maximum.	Mean Minimum.	Rain.
Oct. 1908	76.5	90.1	62.9	0.78
November	73.2	82.7	63.7	4.21
December	74.9	85.7	64.2	2.87
Jan. 1909	74.2	83.2	65.2	11.83
February	72.1	80.3	63.9	1.63
March	69.3	79.3	59.4	3.33
April	65.1	78.1	52.2	0.38
May	61.8	76.9	46.8	0.23
Total				25.26

Provided that the land is well drained, the cotton plant thrives on the majority of soils. On sand, however, the yield is generally small. On bottom lands, in a favourable season, large crops are produced. A loamy soil with a heavier sub-soil is to be preferred as being the most certain to give good returns. Cotton should not be grown on new lands.

A water-logged soil, or one needing drainage will not produce a good crop of cotton. If proper drainage cannot be carried out, on such soils, well formed beds four feet wide should be thrown up with the plough, and a well-defined water furrow left between the beds. The seed is then planted along the middle of each bed.

Owing to the cost of artificial manures in Rhodesia, it is not commercially practical to apply them to the cotton crop. The application of farm yard manure, or the growing of a leguminous crop to be fed off or ploughed under, appears to be the only method of practical manuring cotton here. Farm yard manure must not be applied too heavily, as the cotton plant will then make too much vegetative growth in comparison with fruit (*i.e.* seed and lint) production. If heavy applications of nitrogenous manures are made, it will probably be better to grow a crop of maize before planting cotton.

In cotton growing a rotation of crops is as necessary as in the production of all other crops. Cotton, like maize, is a clean cultivated crop, so that much of the soil tends to be removed by washing. Cotton may follow maize in a rotation, and if planted early, cow peas, etc., may be sown between the rows before the end of the rainy season.

The preparation of land for cotton growing is the same as that for maize growing. As stated above if the soil is inclined to be wet, ridging must be resorted to, and the seed planted on the ridge. Ploughing should be done as soon as the previous crop has been harvested; a good mellow seed bed 8 or 10 inches deep is desirable.

The seed bed must be clean and should be worked to a fine tilth previous to planting; this is necessary to insure the germination of cotton seed.

The time to plant depends entirely upon the early rains. As soon as the soil is sufficiently damp to ensure rapid germination of the seed, planting should begin. Planting may be done by hand, by a special cotton planter, or by a mealie planter fitted with special plates. Where the soil is rather loose, it is advisable to roll before planting to firm the seed bed. This practice is followed in some of the Southern States and ensures a rapid germination. Under unfavourable weather conditions, cotton seed if planted too deeply, *i.e.*, more than 1 inch, will fail to come up.

In the Southern States (except on moist alluvial soils) upland cotton is generally planted in rows 4 feet apart and 12 inches apart in the row. The distance between the plants in the row varies from 8 inches to 14 inches, but it is wise not to exceed 12 inches.

Experiments carried out in Georgia, U.S.A., proved that with 4 foot rows, plants 12 inches apart in the row produced more cotton than those 24 inches apart. Close planting helps the crop to mature early. On poorer land it may pay to reduce the width of the rows to $3\frac{1}{2}$ feet or even to 3 feet, spacing the plants more widely in the row; this, however, can only be proved by experiments carried out in those districts where cotton may be grown. The extra expense of cultivating narrow rows must then be taken into account.

Sometimes 5 rows in every 5 acres of cotton are skipped and planted to maize; this is found a good preventative against boll worm attacks, as this pest prefers maize to cotton.

At about 3 or 4 weeks old, or when the plants are about 6 inches high, they should be singled out, leaving one plant

every 12 inches in the row. Singling is done by hand with the hoe.

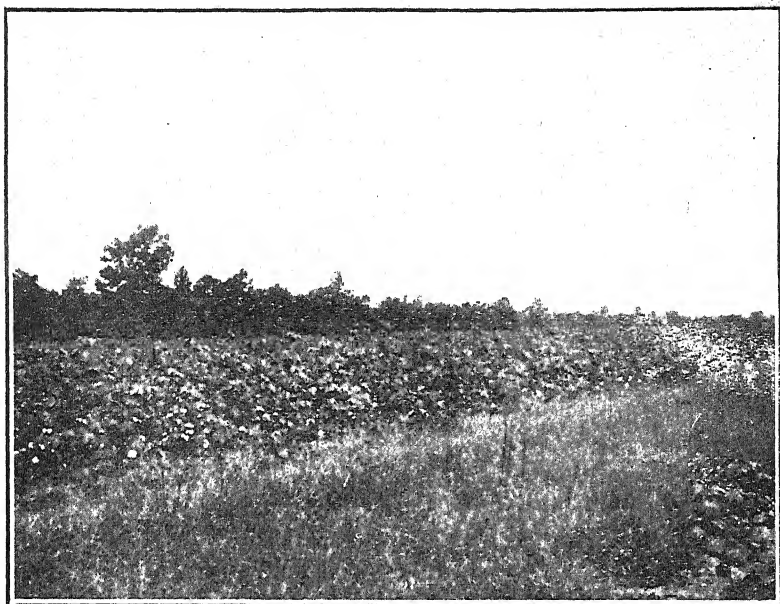
Cultivation should be begun as soon as the rows can be seen, and if a crust forms on the surface before all the plants are well up a zig-zag harrow can be used with advantage. It will not matter if a few plants are destroyed at this stage. Cultivating only means stirring the surface of the ground to a depth of 2 or 3 inches, to prevent the evaporation of soil water and to destroy weeds. A one-horse cultivator, drawn by a mule, is chiefly used in the Southern States for the purpose. One negro will cultivate about three acres a day, and the crop is cultivated about once in 10 days. As soon as the plants are likely to be injured in the process, cultivation ceases. If cultivation is continued after the flowers appear, the cultivator must be run very shallow: otherwise the plant will shed the flowers and young bolls. Cultivation should be early, frequent and shallow.

Topping may be advisable when plants tend to make too much vegetative growth as when grown on rich soils. Where there is any danger from frost, it may be advisable to top as it hastens maturity.

In the Southern States topping is not practised, but where experiments have been carried out the results have been rather contradictory.

Ratooning is the growing of a second crop from the original roots. The writer has seen it practised in the West Indies. The old plants are cut down in April or May to within 12 or 18 inches from the ground, and the second crop is picked about two months later. The planters say that this second crop obtained with but little extra labour makes considerable difference to the financial side of their operations.

Under ideal conditions ratooning may be a bad practice as cotton has been treated as an annual crop for a very long time. The great objection to ratooning is however the opportunity afforded to insects and fungi to increase. If, after one crop is taken, the stalks, etc., are all burned, many insects are destroyed and but few remain to attack the succeeding crop.



Cotton on the State Experimental Station, Georgia, U.S.A.



Cotton ready for picking. State Experimental Station, Georgia, U.S.A.

It is said that the produce from ratoons is generally not of such fine quality as that grown directly from seed.

In the Southern States picking is done by men, women and children, by piecework, 2s. 6d. being paid for 100 lbs. Up-land cotton up to 5s. per 100 lbs., for Sea Island. A good picker will gather 100 lbs. seed cotton per day, depending largely of course on the condition of the crop. The writer has been informed that it is likely that the native in this country could with a little practice pick 40 lbs. seed cotton per day, especially if he were encouraged by the addition of a small bonus to his wages for every 10 lbs. seed cotton exceeding 30 lbs., picked per day. This is equivalent to 1000 lbs. per month working 25 days. Estimating the acre yield at 800 lbs. seed cotton, and the picking season to last 4 months, June to September, one boy would then pick 5 acres yielding 800 lbs. per acre, or 4000 lbs. seed cotton, in the season.

Picking should be done with both hands. The seed cotton (which term is used for lint and seed) is grasped by the fingers of one hand and withdrawn from the open boll. It is then placed in a sack worn round the picker's waist. Dirty or stained cotton is placed in another smaller sack. At the end of each row the cotton is emptied into large baskets or sheets, which are taken up to the storehouse at night and weighed.

Cotton is at present carried from North Western Rhodesia to Beira for $\frac{1}{2}$ d. per lb. by the Rhodesian Railways, and possibly a reduction might be made if produced in sufficient quantity in Southern Rhodesia. The cost of shipping cotton from Beira to Liverpool is 20s. per ton of 2,240 lbs. weight, plus 10% per 40 cubic feet.

The British Cotton Growing Association superintends the sale of cotton and cotton seed forwarded to its order. A charge of 1% commission is made in the case of cotton and $1\frac{1}{2}$ % for seed. This includes brokerage at Liverpool.

Farmers in the Hartley District have kindly supplied me with information from their own experience as to the cost of cotton production.

The following estimate of growing one acre of cotton, producing 800 lbs. seed cotton or 260 lbs. lint, applies only to land which has been under cultivation previously :—

	s.	d.
Ploughing	7	0
Harrowing	3	6
Seed	4	0
Planting	1	0
Singling	1	6
Hoeing	2	6
Cultivating (3 times)	2	0
Picking 800 lbs. Seed Cotton ...	15	0
Depreciation of Implements ...	1	0
Interest on Capital	2	6
Sundries	2	6
Hauling to Railway	1	0
Freight to Beira, 260 lbs. at $\frac{1}{2}$ d.		
per lb.	11	0
Beira to London	5	6
Dock Charges	2	6
Charge 1% per sales commission ...	1	6
	<u>£3</u>	<u>4 0</u>

In these estimates no charge has been made for ginning or baling, bagging or "ties" (i.e. hoops), as it is supposed that the value of the seed should easily cover these expenses, the present value of cotton seed in London being something over £8 per ton.

Eight hundred pounds seed cotton, estimating one-third lint and two-thirds seed will give about 260 lbs. lint and 520 lbs. seed, allowing $2\frac{1}{2}$ per cent. for loss in ginning. Middling American cotton is now worth 8d. on the Liverpool market, so we are justified in expecting 7d. per lb., which would place our cotton two grades lower, e.g. Good ordinary.

260 lbs. Lint @ 7d. ...	£7	11s.	8d.
Less cost of production and marketing	3	4s.	0d.
Profit per acre	£4	7s.	8d.

With cotton seed valued at £8 a ton in London, it might pay to export it, if available in sufficient quantity.

The cost of growing cotton in the Transvaal is estimated by the Department of Agriculture at £1 17s. per acre, but this does not include marketing.

Mr. Simpson, Cotton Expert to the British Central African Administration, gives the following :—

Clearing land, European supervision	£1	10	0
Harvesting	0	3	0
Ginning and baling a crop of 230 lbs.			
Lint	0	13	0
Freight, Blantyre to Liverpool, and			
Insurance	0	14	4
Dock Charges, etc.	0	2	6
Interest on Capital	0	3	0
Broker's Commission and Discount ...	0	3	0
	<hr/>		
	£3	8	10

The average cost of producing an acre of cotton in 1896, on 3325 plantations in the Southern States, was as follows :—

	£	s.	d.
Rent	0	12	0
Ploughing	0	12	0
Seed	0	1	0
Planting	0	1	0
Fertilisers	0	5	6
Sowing	0	0	6
Singling and hoeing	0	5	6
Picking	0	14	0
Ginning and pressing	0	4	6
Bagging and ties	0	2	6
Marketing	0	2	6
Depreciation and repairs	0	2	0
Sundries	0	1	6
	<hr/>		
	£3	4	6

This estimate refers to an average crop of 256 lbs. of lint per acre.

The average yield in the whole cotton belt for the last 10 years is about 185 lbs. of lint per acre. This of course includes the negro tenant working on shares, whose farming is of a very poor order. In 1904 the average yield was almost

205 lbs. per acre, but in 1909 only 157 lbs. per acre—due to bad season, etc.

The highest yield of cotton seen by the writer while in the Southern States was on the State Experimental Station near Greenville, Mississippi—14 acres produced 20 bales of lint cotton of the Cleveland Big Boll variety or roughly 700 lbs. of lint per acre.

This crop had received no manure, but was grown in a rotation with maize and lucerne on alluvial soil.

A very important point in connection with cotton growing, as with the cultivation of all other crops, is the selection of seed. Great stress is laid on this in the United States.

The best plants must be marked in the field, and the cotton from each plant picked and ginned separately and examined carefully.

Next to length of staple, productiveness or yield per acre is the most important quality. Seed cotton should be picked from those plants carrying the greatest number of bolls. The seed obtained from the second picking is always regarded as the best in the United States. Seed should only be taken from plants of vigorous growth and those which are free from attacks by insects and fungi.

Other good qualities, which will be discussed later, must also be looked for in the lint, as colour, silkiness, uniformity in length of fibre, etc.

In those districts where earliness is an important factor, due to boll weevil ravages or early frosts, plants are selected which ripen early, provided they reach a certain standard of excellence in other respects.

The power of retaining the seed cotton in the boll is another characteristic which has been developed in localities which suffer from autumn storms, and good work has been done in selecting seed from plants which show decided resistance to certain diseases.

The principal pests likely to affect cotton in Rhodesia are the Cotton Bollworm (*Heliothis armiger*), the Cotton Stainer (*Dysdercus supersticiosus*) and cutworms.

THE COTTON BALLWORM (*Heliothis armiger*) is an almost cosmopolitan insect and may reasonably be expected to prove troublesome to cotton growers in Rhodesia. The adult is a Noctuid moth. The damage is performed by the caterpillar attacking the young buds and bolls. In addition to cotton it is very fond of maize, being found about the cob where it devours the soft seeds and especially the tassel. It also bores its way into the fruit of tomatoes and attacks many other plants. It is very common in most parts of South Africa. The method recommended in America for keeping the pest in control is to plant maize as a trap crop between the rows of cotton, five rows to every twenty-five of cotton being left vacant for this purpose. Careful directions are given in American publications concerning the time of planting and burning these rows, but careful investigation would need to be made to adapt these methods to Rhodesian conditions. Spraying with arsenicals has met with only partial success.

CUTWORMS.—These are likely to be as troublesome to cotton in this territory as they are to so many other crops. Mix Arsenate of Soda, 1 lb., Sugar or Treacle, 8 lbs. and water, 10 gallons. Chop up a quantity of green stuff finely, wet with above and sprinkle thinly over the fields about a week before the plants are due to appear above the ground. Clean methods of cultivation are desirable as an insurance against this pest.

THE COTTON STAINER (*Dysdercus supersticiosus*) may put in an appearance. This is a bug which stains the cotton red in the bolls. Its ally in America (*D. suturellus*) only becomes a serious pest where the cotton seeds are allowed to decay on the ground, the bug increasing rapidly in this environment. They can be trapped in heaps of cotton seed and destroyed with boiling water, paraffin or any other handy method.

Besides insect pests there are certain well known fungoid diseases of cotton. Anthracnose (*Colletotrichum gossypii*) attacks the bolls stem and leaves of the plant, the greatest damage being done when the bolls are affected; the lint is then discoloured and spoilt. Small reddish brown spots appear on the bolls and increase in size, becoming grey or pink in the centre. The bolls when attacked do not mature

properly; they usually become dry and die without opening, or they open very slightly at the top.

Soaking seeds in 1% solution of corrosive sublimate is recommended, and trials are now being made to produce strains resistant to this disease. Old cotton stalks must be burned and seed selected from perfectly healthy bolls.

Wilt disease of cotton (*Necromyces vasinfecta*), cotton wilt or black root is one of the most serious diseases of the crop wherever it occurs. The plants are attacked at any time after they are a month old. The affected plants wilt, or a few leaves turn yellow and fall off. If the stem or root is cut, the woody portion is found to be brown or black. This discolouration is a typical symptom of the disease, and has given to the name "blackroot." The fungus is found in the soil, enters the roots, grows into the water-carrying vessels and fills them, thus shutting off the water supply. This disease attacks only cotton, and is not identical with the wilt disease of cowpea or water melon. All diseased plants must be burned and no cotton should be planted on infected ground for some years.

There are other diseases of cotton formerly attributed to the action of fungi, but now found to be due to unfavourable climate or soil conditions, such as lack of drainage, exhaustion of humus, etc.

In the preparation of the crop for market it may be advisable to sun the cotton on a frame or bucksail before ginning. This is practised in dealing with Sea Island Cotton, but rarely in the case of Upland Cotton in America. Sunning improves the staple and renders the seed cotton easier to gin. Ginning is the term applied to the process of separating the seed from the fibre or lint. The gins generally employed are of two types, the saw gin and the roller gin. The saw gin is used for short stapled cotton. The seed cotton is fed into a chamber, one side of which consists of a grate of metal bars. Through the slots of the grate project circular steel saws, varying from 40 to 80 in number, arranged on a core. The saws revolve at a speed of 300 or 500 revolutions per minute, engage the fibres, and pull them from the seed and through the grate. The cleaned seeds fall through slots at the bottom of the chamber. A brush

revolving in the same direction removes the lint from the saws, and the cotton is then delivered unto the floor of the gin house. A 60-saw gin, revolving 400 times per minute—the best speed for short staple cotton—will turn out 6 to 8 bales in 10 hours, or 300 to 400 lbs. lint per hour. More work can be done, but the staple is then much injured. In Mississippi, where the long-staple Upland Cottons are grown, saw gins are used, but the speed is reduced to about 300 revolutions per minute; the seed cotton must be mature, thoroughly dry and in good condition. In the larger ginneries, a suction elevator is erected. The wagon full of seed cotton is driven beneath a metal pipe or flue, and the seed cotton is drawn up to the gin by suction caused by a rapidly revolving fan at the top. In selecting engines for driving saw gins, 1 h.p. is usually allowed for every 10 saws, so that a 60-saw gin would require a 6 h.p. engine. Where shafting is used, 1 h.p. extra should be allowed for every 15 feet, counting bearings at 7 feet apart.

In the case of roller gins, the seed cotton is fed on a table to a leather roller, the roughness of which engages the fibre: a steel blade, set with the edge close to the surface of the roller where the seed is delivered, prevents the passage of the seed, and a second rapidly vibrating blade, known as the "beater," fixed a little in front of the first, knocks the seed from the fibre. The cleaned seed then falls through slots in the feed table into a box beneath, and the lint is removed from the roller by a brush placed below it on the side away from the table, and falls on to a sheet spread on the floor. This style of gin is used for long stapled cottons, Sea Island, Egyptian. etc. Its chief advantage is its limited production, ranging from 50 to 90 lbs. per hour, depending on the speed at which it is driven. The longer the staple, the fewer the revolutions per minute. The 40 inch gin is commonly used, and in practice from 3 to 4 horse power are allowed to drive it.

After ginning the cotton is baled. Each ginnery is fitted with a press or baler worked by steam or other power. The commonest form is a screw press. On reaching the market or shipping point this bale is again pressed, or compressed, as the term is. The American bale weighs about 500 lbs., and measures roughly 54 inches by 27 inches by

16 inches, depending on the amount of compression applied. The cotton is covered with coarse bagging and bound with 6 or 8 iron "ties" or hoops. The bagging and ties on the American bale amount to 24 to 30 lbs. weight. Cotton shipped to the Northern States is sold at gross weight, no allowance being made for bagging and ties, but a deduction of 6 per cent. is made on the Liverpool market for these. Sea Island cotton is packed in bags containing 300 to 400 lbs. They are only pressed in a light hand-screw press to avoid damaging the fibre. The Egyptian bale weighs about 700 and the Indian 400 lbs. The former is completely covered with bagging and bound by 11 or 12 ties. Cylindrical bales are put up in some parts of the Southern States, but they are only a fractional part of the whole crop.

The commercial value of cotton depends chiefly upon the length and uniformity of the fibre. Other desirable characters are strength, silkiness, fineness, softness, cleanness and colour.

The longer the staple, provided that the fibres are uniform in length, the higher the price. With length is generally associated fineness of staple. Lack of uniformity in length causes a large amount of waste in the mills and the strength of the yarn spun from such cotton is greatly diminished. For the English market a length of at least one inch is required, and the longer the better. A shorter staple can be sold on the continent.

Cotton is sorted into classes known as grades. In the Southern States the grade is fixed almost entirely by the freedom of the cotton from sand and pieces of leaves known as "trash," and by the colour. The trash, etc., present is removed by the cotton spinner; this entails waste to him, and also increases the cost of manufacture. The presence of "neps" (tangled fibres), "motes" (immature seeds) and immature fibres detracts from the value and lowers the grade.

A pure white cotton is desirable, and the colour must be uniform throughout. Sea Island and some of the Egyptian cottons are creamy and brown respectively in colour, but this does not detract from their commercial value.

Cotton that is stained through action of the weather or by insects is of much less value. On no account should such stained cotton be mixed with white or other naturally coloured cotton. The price of the whole is reduced to the level of the worst. Such a case of cotton, sent from Northern Rhodesia, was seen by the writer last year.

The American system of grading employs seven full grades: Fair, Middling fair, Good middling, Middling, Low middling, Good ordinary and Ordinary. American Middling is the standard by which the Upland cottons are classified in all the leading cotton markets of the world. Other systems of classification are adopted for Sea Island, Egyptian, etc.

Having dealt briefly with the cultivation of the cotton plant and the processes through which the fibre passes before it is ready for the manufacturer, we will now turn to the more important commercial varieties taking them in their order of value.

Sea Island Cotton (*Gossypium barbadense*) is the longest and finest cotton grown. It is cultivated on the islands off the coast of South Carolina, and on the mainland of the States of South Carolina, Georgia and Florida, U.S.A., within 50 miles of the sea. Through the efforts of the British Cotton Growing Association, this most valuable cotton was re-introduced and is now grown successfully in the West Indian Islands of Barbados, St. Vincent, Montserrat, St. Kitts, etc. Sea Island cotton varies in length of staple from $1\frac{5}{8}$ inches to $1\frac{3}{4}$ inches when grown on the mainland, up to $2\frac{1}{2}$ inches on the Sea Islands, where the price paid varies from 1s. 8d. to 2s. 6d. per lb. This cotton is of a light brown or cream colour, very fine, silky and lustrous. It is used in the manufacture of the finest muslins and sewing thread, and is much sought after by French and Swiss spinners. It has a black or naked seed, free from fuzz, so that ginning is comparatively easy. This is always done on roller gins. There is little chance of Sea Island cotton cultivation extending, as it does not do well when far removed from the sea coast. The amount of this cotton produced in the U.S.A. in 1909, was 94,566 bales.

Egyptian cottons (*Gossypium barbadense*) belongs to the same botanical species as Sea Island or to one closely related. The chief varieties grown are Mit Affi, Ashmuni, Jannovitch and Abbasi. Mit Affi is the standard variety of the country. The fibre is strong, fine and lustrous, measuring $1\frac{3}{8}$ to $1\frac{1}{2}$ inches in length. It is light brown in colour. Yields on good average soil 500 lbs. lint per acre. Ashmuni is of a pale brown colour, $1\frac{1}{8}$ to $1\frac{1}{4}$ inches in length. Jannovitch is $1\frac{1}{2}$ to $1\frac{5}{8}$ inches in length, very silky, lustrous and of a beautiful cream colour. Yields slightly less than Mit Affi. Abbasi is of a white colour, and longer than Mit Affi. A great deal of Egyptian cotton is imported into the United States. Manufacturers agree that Egyptian cottons cannot be replaced by Long Staple, Upland or Peeler cotton. In the Egyptian the lint is finer, stronger and more lustrous. It is used for sewing thread and cloths of fine quality and finish. Some 25,000 tons are imported annually into the U.S.A.

The term Long Staple, Upland (*Gossypium hirsutum*) is applied to those Upland cottons which have been bred for their long staple, ranging from $1\frac{1}{4}$ to $1\frac{5}{8}$ inches in length. This cotton is grown mainly in the alluvial regions bordering the Mississippi River in the States of Louisiana and Mississippi. Commercially this is known as gulf cotton or New Orleans, and includes Peelers with $1\frac{3}{8}$ inch staple, and Benders with $1\frac{1}{4}$ inch staple. The best strains of long staple upland cotton are Columbia, Sunflower, Black Rattler, Allen's, Griffin's and Cook's long staple. Some of these have been grown successfully in Uganda, Nyassaland and Northern Rhodesia. If present prices are maintained and local conditions are suitable, these cottons will probably pay best in Southern Rhodesia. Although the yield per acre is usually less than in the case of short staple uplands, the increased price per pound generally more than makes up for the deficiency in yield. These cottons are more delicate, and require greater attention than short staple varieties, but areas suitable for their cultivation are much more limited than those where short staple cotton can be produced. As they take somewhat longer to mature, they are unsuited to those areas in the Southern States which are infested by the boll weevil, so that the production of long staple cottons may be expected to decrease in the next few years.

Most of the cotton produced in the United States has a short staple ranging from $\frac{3}{4}$ to $1\frac{1}{8}$ inches in length, and is known as Short Staple Upland. Cotton of this class can be grown in many other parts of the world, and it has been introduced from the Southern States into West Africa, East Africa, Uganda, Nyasaland, Transvaal and Rhodesia. The improvement of upland cotton has been carried on for many years, the chief characteristics now desired being earliness, productiveness and the power to retain the seed cotton in the boll during stormy weather. There are very many varieties or rather strains of Upland cotton which are grown in various districts. Plants grown on good soil reach a height of some $3\frac{1}{2}$ to $4\frac{1}{2}$ feet, while when grown on poor soil, they often do not exceed 18 inches in height. These cottons are classified into various groups, e.g., Big Boll group, in which the bolls are of large size; Cluster group, in which bolls and leaves are crowded together in a cluster, and Storm-proof group, in which the cotton is held in the boll during stormy weather.

Early maturity of the cotton crop has of recent years become a very important factor in the Southern States, owing to the ravages of the Boll weevil in Texas, Louisiana and Mississippi, and strict attention is being paid to breeding for earliness in these and adjoining states.

Cotton grown in Texas is inferior to that grown in Alabama, Georgia, etc. It is shorter in staple and more harsh to the touch, the result of high summer temperatures.

Valuable by-products as oil, cake, etc., are obtained from the seed after ginning. In some cases the seed is returned to the farmer after ginning, but generally it is sent to the oil mill, which is found in connection with all the large ginneries. Cotton seed contains some 20 per cent. of oil, or 53 gallons to the ton (the American gallon weighs 8 lbs.) Produced commercially 40 gallons to the ton is a high average. After thorough cleaning, the seed is reginned by special machinery to remove the short fibres or down, technically known as "linters." These latter are used to make paper, cheap cloth, etc. The next process is "hulling," by which the seed coat is removed. The hulls when mixed with cotton seed, maize, etc., are used as a stock feed.

The kernels or "meats" are then crushed, heated or cooked, made into cakes and pressed by hydraulic power. The hard cakes resulting are sometimes ground into meal. Sold whole they are known as decorticated cotton cake. The oil may be stored or refined at once. Cotton seed oil is largely sold as olive oil in the United States, and is used in the manufacture of margarine, lard, soap, etc. 2000 lbs. of seed will produce 800 lbs. of hulls, 750 of meal, 50 lbs. linters and 40 gallons of oil.

When facilities do not exist for extracting the oil from cotton seed, it may be used either as a manure or fed whole to cattle. The seed is applied to maize or cotton land at the rate of 20 to 40 bushels per acre. The seed should be broadcasted and ploughed in deeply to prevent it sprouting, or it may be mixed with other bulky manures and left to heat which has the same effect.

The fertilising constituents of whole cotton seed and cotton seed meal per ton of 2,000 lbs., are as follows:—

		Whole Cotton		Cotton Seed
		Seed		Meal
Nitrogen	60.0	125.0
Phosphoric Acid	26.0	56.0
Potash	24.0	36.0

This shows them to have a manurial value of about £3 and £6 respectively. Experiments carried on in America to test the comparative value of the whole seed and the meal for manuring cotton are largely in favour of cotton seed meal.

Cotton seed, cotton seed meal and hulls can be fed to all farm stock, except pigs and young stock. It is one of the cheapest of the nitrogenous food stuffs. Taking the value of maize for feeding purposes at 7s. a bag of 200 lbs., or 70s. a ton, cotton seed has a feeding value of about 84s. a ton. In addition to this there remains the value of the manure. In the Southern States large numbers of cattle are fed almost exclusively on cotton seed meal and hulls; one part of meal may be fed with 2 to 6 parts of hulls. It is doubtful whether hulls should be fed to stock other than ruminants.

From experiments carried out in Texas, cotton seed meal was found to be superior to the raw seed for fattening, but the raw seed made cheaper gains. In some of the experi-

ments the cotton seed was boiled, and gave excellent results. Faster and cheaper gains were made at the Arkansas Station by feeding 1 lb. of meal with 3.3 lbs. hulls than by any other combination of feeding stuffs, and the beef was of equally good quality.

For some time several farmers round Hartley have been experimenting with cotton, and it is proposed that next season a series of experiments in cotton growing should be carried out in the Hartley District, and in any other localities thought to be suitable for the purpose.

These experiments should deal with the following points:—The best time for planting; the proper distances for planting; the best method of planting; the most suitable soils; ridge versus level culture; rotation experiments; green manuring versus farmyard manure; yields per acre; variety tests; effect of topping; best methods of ginning and baling; effect of frost.

From the foregoing details it may be gathered that the success of cotton growing in a new country depends largely on the following conditions:—Suitability of climate; an adequate supply of cheap labour; absence of insect and fungoid pests; a fair yield of lint of good quality per acre; the possibility of erecting a central gin with plant for ginning and baling and perhaps extracting the oil from the seed; cheap railage and sea transport to the English market.

The climate of Southern Rhodesia in certain localities, e.g., Hartley district, appears to be favourable. The irregularity of the rainfall, especially if late, is trying to the cotton planter. Until experimental cotton growing has been carried on for some further time, nothing can be definitely stated as to the suitability of any one locality. Any district where frosts do not occur and where irrigation can be practised will probably produce good yields of cotton.

The labour question has been partially dealt with under the heading of cost of production. More labour is required for cotton than for maize but less than for tobacco. As picking takes place in Southern Rhodesia from June to September, after the natives have harvested their own crops, the labour question ought not to be an insurmountable obstacle.

From insects we must expect a good deal of trouble, as in those districts where cotton is likely to do best, there is not sufficient frost to kill them off in any considerable numbers. Where any crop is grown on a large scale, there is always a fear of insect attacks, as their supply of food is then easily obtainable in large quantities. Although insects do a great deal of damage in the West Indies, they are kept under control by means of Paris Green, etc., and Sea Island cotton is now grown there at a profit.

Upon the yield per acre, quality of lint and price per pound, the commercial success of the industry depends. This can only be determined by experiment, and it is hoped that the results to be obtained this season may be of some service in this direction.

The erection of a ginnery with the necessary plant for ginning, baling, compressing and extracting the oil from the seed is a commercial undertaking, which would probably be best dealt with through a co-operative association. No steps however, can be taken in the matter until the area under cotton is such as to warrant the necessary expenditure. The following estimate for machinery is taken from the West Indian Bulletin, Vol. IV, p. 319:—

12½ h.p. oil engine complete	...	£235
Pulley, shafting, brackets and belting		
complete	...	150
Eight (8) gins	...	200
Tramping press, steam driven and		
fixing	...	200
Sundry materials and fixing gins	...	250
Carriers for cotton in loft and ginning		
room, stores, etc.	...	150
		<hr/>
		£1185
Buildings, etc.	...	1150
		<hr/>
Total	...	<u>£2335</u>

Such a factory working 3 to 5 months in the year should deal with all the seed cotton produced on 2000 to 3000 acres. A smaller factory to deal with all the seed cotton produced on 800 acres might be installed for half the above estimate.

In England a 40-inch roller gin, capable of producing 40 lbs. lint per hour, will cost £22. A screw press, timber built, power driven, will cost about £125, while a small ratchet press timber built, hand-driven, from £18 upwards.

Plant for expressing oil from seed costs from £22 upwards. Probably the smallest which would be of any use would cost from £100 to £200, pressing from $\frac{1}{2}$ to 2 cwt. seed per hour. In each case power would be extra, 6 h.p. being required for the larger plant.

The writer wishes to take this opportunity of acknowledging his indebtedness to the various Professors of Agriculture and Agricultural Experiment Station workers in the United States, who afforded him every facility for studying the methods employed in cotton production: also to Mr. Bateson Manager, British Cotton Growing Association North Western Rhodesia, for information supplied on cotton ginning and baling machinery; to Mr. Jack, Government Entomologist, for the notes on cotton insects, and to the authors of the following papers and articles from which much assistance has been derived:—

1. Report on the present position of cotton cultivation, presented to the International Congress of Tropical Agriculture at Brussels, May, 1910, by Professor Wyndham R. Dunstan, M.A., LL.D., F.R.S., Director of the Imperial Institute, London, S.W.

2. Various West Indian Bulletins and other papers published by the Imperial Department of Agriculture for the West Indies.

3. Bulletins of the United States Department of Agriculture:—

FARMERS BULLETINS: No. 217, Steps in securing an early crop of cotton; No. 302, Sea Island Cotton. BUREAU OF PLANT INDUSTRY: Bulletin 33, The Cotton Plant; Bulletin 62, Notes on Egyptian Agriculture; Bulletin 128, Egyptian Cotton in S.W. United States; Bulletin 163, Varieties of American Upland Cotton. DIVISION OF STATISTICS: Bulletin 16, Cost of Cotton Production.

Winter Cereals without Irrigation.

By H. GODFREY MUNDY, F.L.S.,
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During the last two or three years no little has been talked and written about *dry farming* in South Africa, and there are those who maintain that by thorough cultivation the moisture absorbed by any soil during one or more rainy seasons can be conserved in sufficient quantity to permit the growing of profitable crops of winter wheat entirely unassisted by precipitation during the actual period of growth. As is generally known the principle, or more properly, the adaptation of dry-farming methods originated in the arid States of Western America and involves deep ploughing in conjunction with most thorough cultivation in order to keep the surface soil loose and thus to check loss of moisture through evaporation.

Briefly stated, the ideal conditions suitable for dry farming are (1) an impervious layer of subsoil formation at a depth of several feet below the surface; (2) a moderately light and friable surface soil, *i.e.*, one approaching a loam, which can be worked again shortly after rain and the top layer of which by cultivation can be maintained in the form of a loose mulch or dust blanket; (3) an intermediate stratum of fine grained porous soil, capable of storing up large supplies of water which will be gradually drawn towards the surface, and in proximity to the roots of the growing plant, by capillarity. This intermediate layer forms the reservoir of soil moisture. Upon our own or nature's ability to provide sufficient storage depends the success of the crop.

The principle of capillary attraction is that each minute soil particle is more or less surrounded by a thin film of moisture. As evaporation from the surface takes place, a gradual stream of this water passes upwards through the minute spaces or tubes formed between the soil particles and is lost in the atmosphere. The maintenance of a loose mulch on the surface breaks the connection of these tubes and loss due to evaporation is reduced to a minimum, since the

moisture only rises to a certain height and is there checked and held in suspension by the breaking of capillary attraction. To those familiar with the soils of Southern Rhodesia and who are at the same time keen observers of their surroundings, it will be at once apparent that large tracts of country to a great extent naturally fulfil the most exacting requirements of the dry farmer.

The granite vlei is composed generally of a mixture of coarse and fine grained sand, closely intermixed with a high percentage of decayed organic matter, and in effect producing a loamy soil. It is of varying depth, and being usually underlain by a mass of impervious granite rock, the water is held in suspension and the soil remains moist throughout the whole winter at a few inches below the surface. The latter being composed of the coarser sand forms an effective mulch, and thus checks the exaporation. During the rainy season, many of these vleis are too wet to grow summer crops unless an extensive system of surface drainage has been introduced, while on much of the higher lying land, the water table often rises to within a few inches of the surface, and after continuous rains this land also may become too wet for the proper development of summer crops. These facts are well known to the farmer on the granite veld, and the object of these notes is to draw attention to the manner in which such soils may be turned to profitable account.

Vlei soils are not of course confined to the granite veld but in sandstone and formation areas, where the vegetation is relatively more rank and containing as they usually do an excess of decayed vegetable matter, they partake more of the nature of peat soils. Experiments which have been carried out appear to indicate that such land is unsuited to wheat growing, though often producing good crops of barley, oats and rye. On an excessively peaty soil wheat frequently fails to set any grain at all. This fact was recognised by the early Dutch settlers of the Transvaal, and in such cases experience has taught them to crop first with maize and oats, when, after a few years wheat may often be successfully grown.

Speaking broadly the granite country is more or less similar throughout the whole of Southern Rhodesia, but the extent of naturally moist soil varies according to the general contour of the country and the average annual rainfall. Typical

examples may be found in the Makoni, Mrewas, Marandellas and Charter districts, and also throughout the tract of country known as the Somabula Flats, while there are doubtless many similar and larger areas in other districts. Where irrigation has not been available, several farmers have for years grown small crops of winter forage—barley and oats—on naturally moist soil, and within the last two seasons more systematic experiments have been conducted, but as yet these also only on a relatively small scale. It is by no means an uncommon practice with some farmers to plant early potatoes in August on damp land in order that the crop may be lifted in November when potatoes are relatively scarce. Similarly we find that many of the native kraals plant their maize on vlei ground during the same month, and thus sometimes secure two crops in the same season from the same ground. When local supplies of maize were less abundant than now and when, owing to shortage of stocks, early maize in March and April often commanded a premium, many farmers favourably situated, as, for instance, Mr. Backhouse, on Calgary, Mr. Scott, on Springvale, Mazoe, and Dr. Bone, on Borrowdale, planted their vlei land crops in August and September, before the commencement of the rains.

In order that this could be done, the soil must have retained its moisture throughout the five winter months, and there remains, therefore, no reason why the land, instead of lying idle, should not have been carrying a crop during that time. Within the last five years the writer has repeatedly urged the importance of utilising naturally moist land of this character for winter cereals, and it will be of interest to Rhodesian farmers to learn that on the eastern high veld of the Transvaal, where the conditions are certainly no more favourable, the growing of winter wheat without irrigation is rapidly extending. A distinction, however, must be recognised between the methods here advocated and the precepts of the supporter of dry farming. At present the writer only advocates that farmers should utilise the benefits in the form of soils naturally retentive of moisture which Nature has placed ready to their hands, and which in existing circumstances are usually lying waste, producing only sour and practically worthless grasses.

Further reference is made to this subject in the article descriptive of the district of Makoni, and also in the paper by Mr. R. le Sueur Fischer, read before the Headlands Farmers' Association and printed in this number of the *Agricultural Journal*; but the importance of finding profitable crops for the granite country, and in particular of being able to supply our own requirements in the matter of wheaten products is so great that no apology is necessary for affirming and repeating arguments which may have already been used elsewhere.

The actual growing of wheat, oats, barley and rye on moist land without irrigation is no longer a matter of speculation: it has become an established fact, and to-day the granite veld in particular of Southern Rhodesia stands on the threshold of becoming of importance for the production of winter cereals. Let us pause a moment and consider what this statement means to Rhodesian farmers. On the evidence of Mr. Fischer and on the strength of experiments carried out by several other farmers, as for instance Messrs. Power and Ries on Silverbow and Mr. H. Michell on Lesapi Cave, it has been shewn that such land without manure will produce crops of winter wheat. The present price of wheat in Rhodesia varies from 25s. to 30s. per bag of 200 lbs. for milling purposes. Mr. Fischer estimates his average crop at five bags per acre. In the Southern Provinces of the Union, the price varies from 18s. 6d. to 21s. per bag, and South Africa is wholly unable to meet her own requirements in this line, and enormous quantities of Australian and Canadian wheat and flour are annually imported. There is little prospect, therefore, of prime wheat falling below 10s. per 100 lbs. in value for many years to come, even if it ever should do so.

Other farmers have grown good crops of rye, barley and oat forage without irrigation. The breweries of South Africa are continually making enquiries for barley suitable for malting purposes, but up the present have been unable to find adequate local supplies. Barley meal is an important item of diet for dairy fed pork, and the six-rowed Cape barley, though not of the highest quality for malting purposes, is a heavy cropper and will always command a ready sale, while in addition as green forage it forms an excellent feed for dairy cattle or pigs.

Rye, though not in great demand as a grain, provides excellent green fodder, and the farmer who can feed his green rye or barley fodder in conjunction with maize meal is in a position to take up winter dairying and to profit by the high prices which rule at that season of the year for all dairy products.

Oat forage is a crop, the production of which can be easily overdone, as Cape farmers have learnt to their cost, but the green forage can always be utilised for dairy cattle, and there are prospects of growing a good threshing oat which will command a ready local sale, and any surplus of which might be exported. Finally in other countries, as an instance Australia and, even nearer home, the Transvaal and the Orange Free State, it is not an uncommon practice to grow winter cereals for the purpose of providing succulent grazing for sheep during the winter months. Oats are in particular favour for this purpose, but in Australia wheat is frequently fed off by sheep, and later if the season is favourable, the crop is allowed to run into ear and an additional profit is derived from the grain.

As has been said Rhodesia is on the threshold of an era of winter cereal production, and the acceptance of the term in its literal sense implies that there is much to be learnt when the threshold is crossed. Our present knowledge, beyond the fact that certain varieties can be grown profitably, is of the scantiest and there is much to be ascertained before we can hope to turn our vleis to the best advantage. At the same time, facts have been established, as for instance that Early Gluyas Wheat and Bob's Rust Proof are both suitable varieties. It is more than probable that some of the "Durum" wheats will prove even heavier croppers, but to test this, comparative variety trials must be carried out. Similarly with barley, it remains to be proved whether the growing of malting barley will be as profitable as wheat, and if so, which varieties are best suited to local conditions.

Early rye or Cape rye has almost without exception given good results, and late mammoth rye may be expected to give good grazing and later to yield a heavy return of grain. Rye more than any other grain crop is well adapted to poor sandy soils, and yet in experiments conducted in the Mazoe District, it has also given a good return of grain on land too

rich for wheat. As far as oats are concerned, Mr. Fischer has found Algerian to give good results though rather slow to mature. The old Boer oat is quicker but requires a richer soil, and the Sidonian oat which is an early maturing kind and suited to comparatively poor soils is likely therefore to prove even more suitable. If a stout threshing oat is required, the New Zealand, white Canadian and several others which are doing well in other parts of South Africa are deserving of trial.

To sow at the right time is of the utmost importance, but time of sowing must be governed by the variety which is grown and the condition of the land. Speaking generally, from the middle of March to the middle of April appears the most suitable time, but some of the slower maturing kinds might be sown earlier, and the same applies to some land which tends to dry out quickly.

The method of sowing is also of importance; at present almost all small grains are sown broadcast, but with winter cereals without irrigation drilling the seed will certainly give better results, since a uniform depth of planting is assured, and even though the land may be dry on the surface, the seed can be put sufficiently deep to be in moist soil. Where good results have been obtained by broadcast sowing, it is safe to say they would be infinitely better if the seed were drilled in.

Preparation of the land is again important. Some soils would benefit by rolling to make them more compact; others may be too wet for this to be attempted. Some lands will be the better for shallow surface drains to lead off excess of water; others again may be sufficiently firm to permit harrowing after rain and so preserving a surface mulch to check evaporation. Harrowing after the crop is up may often be helpful, but frequently the soil is too loose to permit of this, and instead rolling to consolidate it may be advisable.

Wheat at 20s. to 25s. per bag is a sufficiently profitable crop to warrant the use of artificial fertilisers, even at their present high prices, presuming the acre yield may thereby be increased by one or two bags. Some soils may grow good crops of barley and rye, but only poor crops of wheat. On such the use of artificial manures in wheat growing may

prove profitable, and in this connection it may be remembered that nowhere in the world is the value of wheat higher than in South Africa, and this fact may therefore be set against the high cost of the fertiliser.

Summarising the results of various experiments which have been carried out in Rhodesia, we arrived at the following important facts :—

- (a) Winter cereal crops can be grown on naturally moist land without irrigation ;
- (b) On excessively rice peaty soils, rye and oats are likely to give better results than wheat ;
- (c) Rye is the most promising crop for poor sandy soils, but most of the granite vleis will grow wheat ;
- (d) Wheat should be sown on well worked land ; for newly broken soil oats and rye are preferable ;
- (e) In growing wheat under these conditions, a dressing of artificial fertilisers supplying phosphates and potash would probably be beneficial, but when a mixed manure is desirable, double complete Safco or any similar fertiliser, at the rate of 70 to 80 lbs. per acre, should lead to a considerable increase in crop ;
- (f) The month of March to the middle of April appears the most suitable time for sowing ;
- (g) The thickness of sowing depends largely on the nature of the soil, but for wheat and rye about 40 to 50 lbs. per acre should be sufficient, and for barley and oats about 60 to 75 lbs.

The naturally moist soils of this Territory vary so much in character and relative moisture retaining qualities that it is impossible at present to lay down any hard and fast rules, but the farmer who possesses land of this character should lose no time in putting it to the actual test, and to this end facilities are offered by the Agricultural Department in the

free issue of winter cereal seeds under the terms of co-operative experiments. If, as is hoped, it may be possible at an early date to establish an experiment station on granite veld for the benefit of farmers occupying that class of land these problems will be systematically investigated, and meanwhile, no farmer will be the loser by preparing an acre or two for experiments on his own farm, and those who have already formed some idea of the potentialities of their moisture retaining vleis will be the first to recognise the importance of doing so.

The Transmission of Horse Sickness through the Dog by Feeding.

By L. E. W. BEVAN, M.R.C.V.S.

Post Graduate of the Royal Veterinary College, London,
and Pasteur Institute, Paris.

In view of the recent controversy as to the susceptibility of the dog to African Horse-sickness, the following observations may be of interest.

From the 23rd to the 30th January the hounds of the Gwelo Hunt Club were fed on a mule that had died during the reaction following Dr. Theiler's method of immunising against Horse-sickness. On the 30th they were given the hind leg of another mule which had been inoculated six weeks previously. On 2nd February (ten days after they commenced to feed upon the first mule) one hound died during the night. This animal had been noticed to be off its feed at the previous evening meal but all the others ate well and appeared in good health. At 9.30 a.m., on the 2nd February, the hounds 'Pilgrim' and 'Vixen' shewed the first symptoms of the disease, and at 1 p.m. the former died, while 'Vixen' died at 6 p.m. the same day. On the morning of the 3rd, 'Vista' and 'Mentor' developed the sickness and were dosed twice a day with arrhenal. 'Vista' recovered after two days, and 'Mentor' after five days sickness.

On the evening of the 3rd February, "Music" and "Haughty" shewed symptoms and both were removed from the kennels, the latter dying during the removal; "Music" was carefully nursed and dosed with arrhenal but died on the 6th.

The remainder of the hounds in the kennel, consisting of six half-breds and ten thoroughbreds, were not affected by

the disease; one thoroughbred bitch receiving double rations of meat shewed no signs of any sickness. For the past two or three years it has been the custom to feed the hounds on the carcasses of animals that have died from horse-sickness.

About the same time eleven dogs in Gwelo, which also consumed some of the inoculated mule, died in the vicinity of the kennels: several died at the same time as the hounds and some shortly before the hounds became affected.

The symptoms described by Mr. J. A. Godfrey, Honorary Secretary and Huntsman, and G. V. S. Rowland Williams (who proceeded to Gwelo to investigate the outbreak) were, quickened and laboured breathing, high temperature, and death generally three to eight hours after the onset of symptoms. As the disease developed the jaws became tightly locked and the tongue a distinct bluish colour. The mouth appeared abnormally dry. Mr. Williams states that the visible mucous membranes were anaemic rather than congested.

The only post-mortem lesion mentioned is froth in the lungs.

On the 5th February Mr. Williams kindly obtained a quantity of blood from the hounds "Music" and "Mentor," which was mixed with the usual glycerine, water, phenol preservative, and was brought to the Laboratory where it was kept until the 24th February.

On that day 20 c.c. of this virus, made up of equal quantities from each hound, was injected under the skin of the neck of the horse "Don Q," which had been and was subsequently kept in a mosquito-proof stable at the Laboratory. The following is the temperature record of this animal:—

Subject	... Bay Gelding "Don Q."
Date	... 24/2/II, at 4.30 p.m.
Virus	... 20 c.c., blood taken 5/2/II from hound, Gwelo, suspected to be suffering from horse-sickness. Subcutaneous injection.

Date.	No. of days.	Morning temperature.
25/2/II	1	100'4
26/2/II	2	100'2
27/2/II	3	100'0
28/2/II	4	100'0
1/3/II	5	100'2
2/3/II	6	103'0
3/3/II	7	104'2
4/3/II	8	104'6
5/3/II	9	100'8
6/3/II	10	Dead.

On the 4th March this horse was noticed to be extremely dull and shifted from one foot to the other in the manner characteristic of Horse-sickness ("Paddling"). On the 5th idem, it shewed the typical symptoms of "Dik-kop." It died early on the morning of the 6th, and post-mortem examination revealed the characteristic lesions of Horse-sickness, notably, large quantities of straw-coloured fluid in the pericardial sac, intense hyperaemia of the villous portion of the stomach.

During the course of the autopsy portions of the heart, liver and muscles of this horse (about six pounds in all) were thrown to a large mongrel bitch, who swallowed them greedily and retained them. This dog was kept under observation, the following being a record of her subsequent morning temperature :

Subject : Large Mongrel Bitch.

Virus : Fresh liver, muscles and heart of horse, dead from horse-sickness, fed to bitch..

Date : 6/3/II.

Date.	No. of days.	Morning temperature.
10/3/II	4	102'2
11/3/II	5	101'8
13/3/II	7	101'8
14/3/II	8	102
15/3/II	9	101'8
16/3/II	10	102'4
17/3/II	11	101'2
19/3/II	13	103'8

Date.	No. of days.	Morning temperature.
20/3/II	14	103°6
21/3/II	15	104°2
22/3/II	16	103°4
23/3/II	17	103°4
24/3/II	18	99°6
25/3/II	19	101
27/3/II	21	101°8
29/3/II	23	102
30/3/II	24	101°2

N.B.—The period of incubation—13 days—is considerably longer than in Theiler's cases produced by inoculation, when it averaged from 5 to 7 days.

On the morning of the 19th March, thirteen days after eating the horse-sickness meat, the owner of the dog drew attention to its peculiar behaviour, fearing that it was developing Rabies. The animal was noticed to be excited, was snapping and rolling, and appeared to be suffering pain about the head. It frequently pawed at its mouth from the corners of which escaped a thick saliva. This condition, while gradually improving, lasted for two or three days.

On the 21st March, when the temperature was at its highest, 30 c.c., of blood was taken from the dog, and, having been citrated, was injected under the skin of the neck of the horse "Saba," a gelding some 15 years old, said to have recently come from the Orange River Colony.

On the 6th day after inoculation its temperature began to rise, and its supra-orbital fossae, hitherto very deep, began to fill. Day by day the symptoms of "Dik-kop" increased, the mucous membranes of the eye became almost claret-coloured, the lips and gums assumed a bluish-red, a well-marked oedema accumulated between the angles of the jaw and obliterated the jugular furrow. Later the swellings above the eyes, well seen in the photograph, assumed the size of half a cricket ball. The heart-beat became slow and feeble, and the horse became extremely weak.

Subject ... Bay gelding (15 yrs. old) "Saba."
 Virus ... 30 c.c. fresh citrated blood from half-bred bitch which, on 6/3/II, was fed on liver, muscle, heart, etc., of horse "Don Q.," dead of "dik-kop." Subcutaneous injection:
 Date ... 21/3/II.

Date.	No. days.	Temperature.	
		Morning.	Evening.
22/3/II	1	99'3	
23/3/II	2	99'4	
24/3/II	3	100'0	
25/3/II	4	100'1	
26/3/II	5	100'0	
27/3/II	6	100'6	102'4
28/3/II	7	102'2	102'8
29/3/II	8	102'8	104'8
30/3/II	9	103'8	105'0
31/3/II	10	103'4	104'2
1/4/II	11	102'4	103'2
2/4/II	12	101'0	
3/4/II	13	101'2	100'4
4/4/II	14	90'4	99'4

TABLE OF PASSAGES.

Mule (died during inoculation by Theiler's method).

Dog (Gwelo Hunt Club hounds, "Music" and "Mentor.")

Horse ("Don Q.")

Dog (Half-bred bitch).

Horse ("Saba.")

It will be remembered that Dr. Theiler recorded in the "Report of the Government Veterinary Bacteriologist, Transvaal, Department of Agriculture, 1905—1906," certain experiments in which he sought to infect dogs with horse-sickness, and from which he drew the conclusion that:

1. It is possible to transmit horse-sickness into dogs and to transmit the virulency from dog to dog. Horse-sickness in dogs has a very rapid course both in incubation and temperature re-action.
2. The post-mortem lesions found in dogs are identical with those of a horse.

Professor M'Fadyean, recognising the importance of the question "Where in a horse-sickness district is the virus of the disease during the six or eight months which separate successive animal outbreaks?" carried out certain experiments with the object of obtaining further evidence as to the susceptibility of the dog to horse-sickness, using infective filtrate obtained by passing diluted blood through a Berkefield filter in order "to exclude the effects of other things than horse-sickness virus, which might be accidentally present in the blood," and injecting the virus subcutaneously in small quantities on the grounds that the intravenous method was non-natural, and that it was not desirable to use an excessive quantity of infective material or one much greater than is known to be sufficient for the infection of a susceptible animal.

He also considered it possible that Theiler, when infecting horses with virus which had been passed through a dog, did so by reason of part of the original virus remaining in dilution in the dog.

As a result of his experiments he drew the deduction that "in view of the resistance which the dog offers to experimental infection with horse-sickness virus, it is improbable that animals of that species are ever infected in natural circumstances, or that in horse-sickness districts the canine species can constitute a 'reservoir' for the infection of horses through the medium of an insect."

Subsequently Theiler conducted certain further experiments, passing the virus from dog to dog as far as the thirtieth passage. His experiments were so modelled as to eliminate M'Fadyean's objections, who, in commenting upon them, concedes that "the new and more numerous experiments will no doubt be generally accepted as proving that horse-sickness can be experimentally conveyed to the dog by inoculation."

The conclusion which appears to be warranted by the observations and experiments made in this country is that dogs may become infected in natural circumstances by feeding on infective meat.

The question as to whether "the canine species can constitute a 'reservoir' for the infection of equines through the medium of an insect" naturally follows and is now being put to experimental proof.

NOTE.—Photographs of the sick animals mentioned in this contribution, having been received too late for publication, will be reproduced in our next issue.—EDITOR.

Notes from the Agricultural Laboratories:

ENTOMOLOGICAL:

KRAAL MANURE AND CUTWORMS.—The idea that cutworms are carried on to the land with kraal manure is so widely spread in this Territory, and has apparently taken such a firm hold of the minds of some farmers that it is thought desirable to point out its erroneous nature in these notes. That the Dutch farmers in the Cape Colony hold a similar belief is shown by the name "mestwurm" (or manure worm), which is applied to this insect to-day. This name, however, was also given to the grubs of certain Scarabaeid beetles which live in manure, and to their near relations the grubs of the Chafer beetles which live in the earth.

As to the origin of the idea, it is perfectly true that under certain circumstances, if one part of a field be manured and the other not, the former often suffers the more severely from cutworms. From this the inference has been drawn that the cutworms are carried in the manure. The delusion has doubtless often been aided by the confusion of the insects to which the name *mestwurmen* is applied. The family of beetles known as the *Scarabaeidae* is divided into two great divisions, one of which comprises the scavengers, dung beetles, etc., the grubs of all of which live in manure and are perfectly harmless to plants, and the other the chafers, cockchafers, May beetles, etc., the grubs of all of which live in the earth and devour the roots of plants, sometimes doing as much damage as cutworms themselves. The grubs of the scavengers and the leafchafers, though the former are beneficial and the latter highly injurious, are not easy to distinguish the one from the other, and hence must undoubtedly be generally confused, thus furnishing another apparent proof that mestworms are carried in manure.

If we consider the life-history and habits of cutworms we can see how impossible it is that they should be bred in the kraals, and how it is that they are apt to be destructive on manured land. Cutworms are the caterpillars of a certain group of Noctuid moths. The female moths lay their eggs

on stones, leaves, stems of plants, etc., in some situation where there is plenty of green stuff around so that the newly-hatched larvae may easily find food. The habits of the larvae are only too well known, they hide in the earth during the day and emerge at night and cut through the stems of plants above the level of the ground surface. When full-fed they pupate in an earthen chamber in the ground. The reason of the severe infestation of the manured ground which sometimes occurs is due to the fact that the weeds grow more quickly and become more succulent on this portion, thus attracting the hungry caterpillars from the other portions, and also the female moths, if they are about, looking for a suitable place to lay their eggs. Then when the maize appears the ground is badly infested with the cutworms and the crop suffers accordingly.

The remedy is to bait the ground as already described in this Journal (December, 1910) a little before the maize is due to appear or a few days before planting out in the case of tobacco plants, etc.

TURNIP SAWFLY AGAIN.—In the April issue of this Journal last year a note appeared under this division concerning the destruction of a field of turnips by a species of sawfly. This insect has been abundant and destructive in Salisbury this year, and it has been found possible to obtain photographs of the damage done to certain crops, and also to obtain illustrations of the insect itself. These are reproduced in these pages. Figure 1 shows a drawing and a photograph of the mature Sawfly. The actual length of the body from the head to the tip of the abdomen is about $6\frac{1}{2}$ m.m. (almost exactly $\frac{1}{4}$ inch), and from one wing tip to the other from 15 to 17 m.m. The proportion of the wing spread to the length of the body varies in different specimens. The abdomen, the greater part of the legs, and the inner portion of the wings are yellow, the thorax, head, antennae, the front edge of the upper wings, and the tips of most of the leg joints are black. The tips of all four wings are smoky. (See illustration.) At Figure 2 is shown a photograph of several of the larvae at work on two turnip leaves. The colour of the larvae varies from deep olive green to dark grey, with a more or less conspicuous yellow line along each side. When full grown they

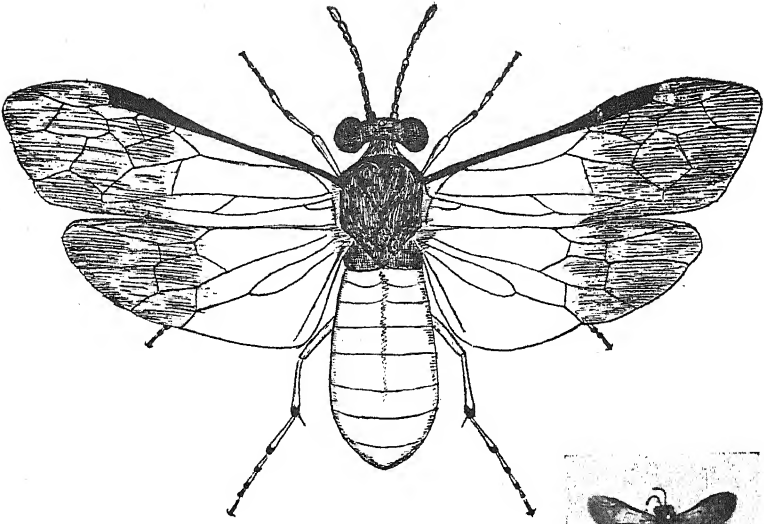


Fig. I.

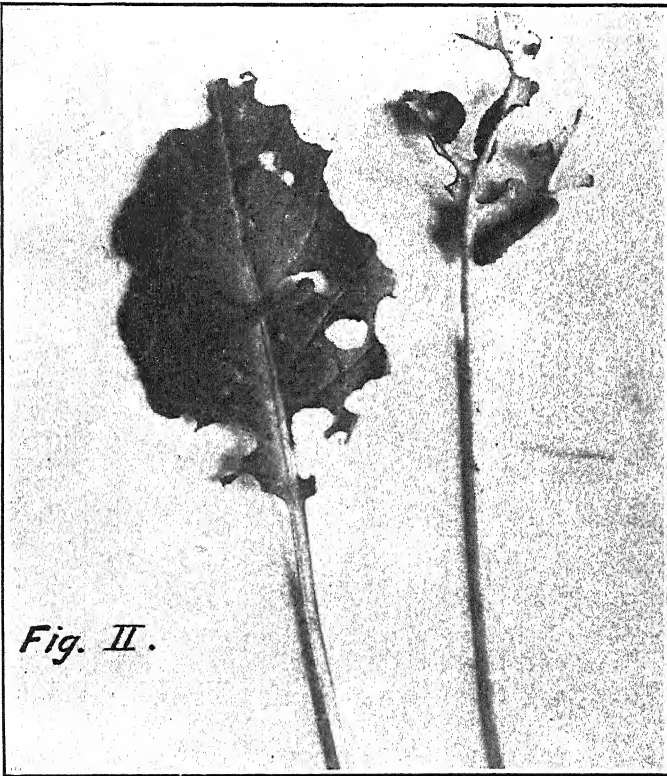
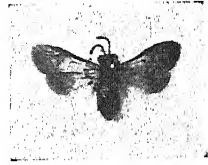


Fig. II.



Fig. III.

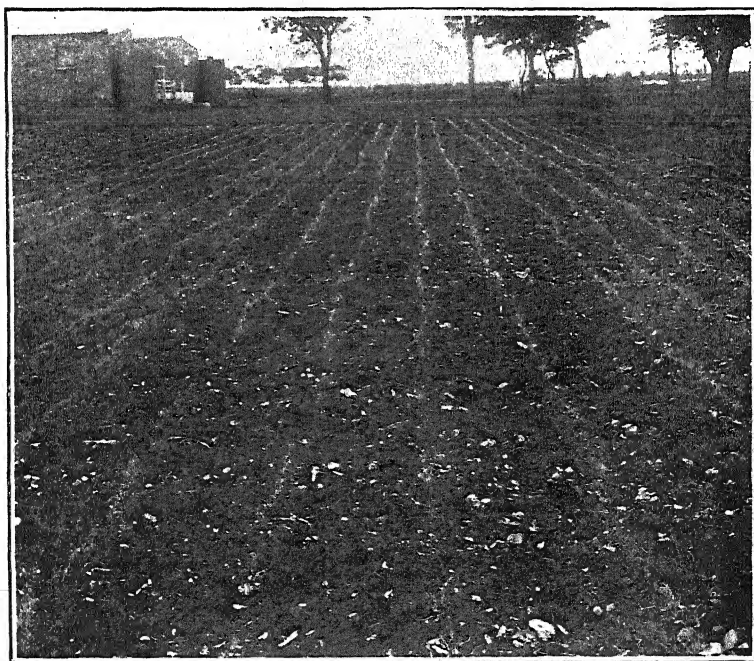
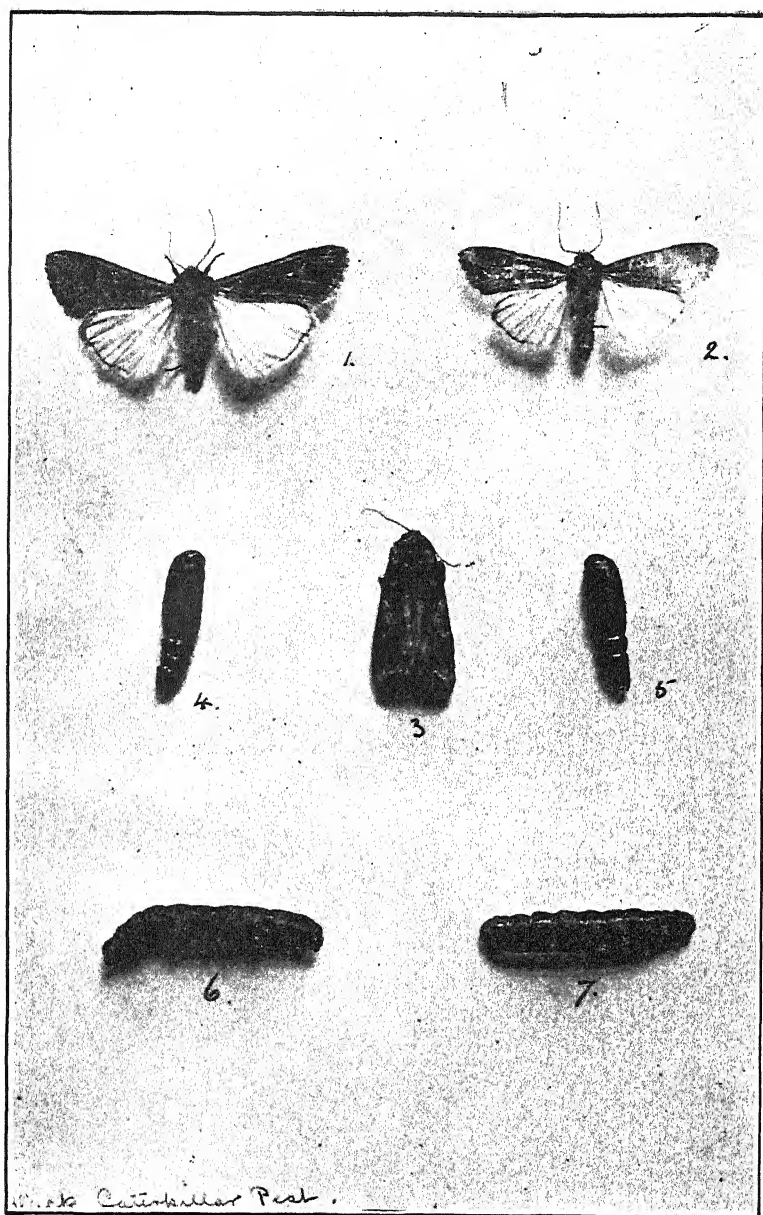


Fig. IV.



Black Caterpillar Pest.

are nearly three quarters of an inch in length. They much resemble caterpillars in general appearance, but differ in the possession of eleven pairs of feet, whereas the vast bulk of caterpillars have only eight pairs. When full grown the larvae enter the earth, and there each spins a cocoon about five-sixteenths of an inch in length. This cocoon is moderately tough, and the earth adheres very closely to it, rendering it very difficult to find by digging in the ground. The length of the pupal period appears to be very uneven, some specimens emerging in the laboratory nine days after spinning up, and others taking as long as eighteen days. The average appears to be about 15 days. The eggs are laid in the leaf. The position has not been observed in the larger leaves, but in the seedlings they are laid usually at the edge, the female cutting a slit in the leaf with the saw-like apparatus which gives the common name to this family. The duration of the egg period is about five days at this time of the year (February).

The damage done by this insect is illustrated in Figures 3 and 4. Figure 3 shows a patch of turnips badly infested with the pest. Note the bare ribs of the plants in the foreground. This patch subsequently recovered to a large extent. Figure 4 shows a patch of Kohl-rabi, absolutely eaten up. This patch never recovered at all, and had to be re-sown. A patch of rape suffered as severely as the Kohl-rabi. The insect seems to confine itself to cruciferous plants. When all the Kohl-rabi was devoured many of the nearly full grown larvae wandered into a patch of Mangold Wurzel close by, but would not touch it at all.

The larvae do not yield as readily to arsenical poisons as might be expected. The patch of turnips illustrated was sprayed on January 23rd with Lead Arsenate at the rate of 1 lb. to 16 gallons water, and again on January 25th, living larvae continuing abundant and the crop being steadily devoured. On January 27th it was sprayed again with Arsenate of Lead, 1 lb., Black Sugar, 1 lb., and Water, 10 gallons. On January 21st living larvae were still abundant, and but few dead could be found. The spray was supplied through a Vermorel knapsack pump, and it is true by a Kaffir, so that the poison was not distributed as evenly as might have been wished, but even the plants which received

the strongest dose bore numbers of living grubs. Rain also fell daily but the poison adhered very well to the leaves and seemed but little affected by the showers. The crop was saved for the time being by the pupation of the larvae early in February.

The insect appears to be a very close relation of the Turnip Sawfly (*Athalia spinarum Fabr.*) which is a well known pest in the British Isles, but it differs from the description of that species on several points.

BLACK CATERPILLAR PEST.—During April last year Salisbury township was visited by a plague of blackish caterpillars, which fed on the grass bordering the roads, and on unoccupied stands. Shortly after this appearance complaints were received from Umtali district of the destruction of the rukweza crops by a similar pest, and on specimens being forwarded by the Native Commissioner they proved to be of the same species. What was probably the same pest was reported from the Charter district, where the crops were said to have been saved by the timely appearance of the White Stork, better known as the Large Locust Bird, which exterminated the caterpillars.

In order to determine the species and learn something about the pest, specimens were collected and reared in the Laboratory. The adult moths were forwarded to the British Museum, and were there identified by Sir George Hampson as *Laphygma exempa. Wlk.* The accompanying plate illustrates the adults, pupae and larvae. The upper wings of the adult are often nearly black, but the shade varies, and in some specimens, as in that shown with closed wings, the pattern is quite clear. The under wings are silvery white with a narrow dark border. The width across the spread wings varies from rather more than an inch and one-eighth to an inch and three-eighths. The pupa, which are to be found quite bare in the earth are a pale reddish brown, and vary from nine-sixteenths to eleven sixteenths in length. The April brood last year pupated towards the end of the month, and the adults emerged about the middle of May. The caterpillar is naked, and when full grown its length is about one inch and an eighth. The back is a very dark green with clear cut fine lighter lines, the sides and ventral parts, including the legs, are light.

This pest appears to attack only Gramineous plants—grasses, rukweza, etc. Though not recorded, it would probably be as great an enemy to other cereals. The Native Commissioner, Umtali, last year estimated that there were about 150 square miles covered by the pest. Such visitations are, however, likely to be intermittent.

The ever useful White Stork would seem to be an effective check, as in addition to the experience in the Charter District this bird was seen in numbers paying attention to the swarm in the Salisbury township. Parasitic Tachinid flies emerged from a few of the larvæ in the laboratory.

The most promising remedy for this pest appears to be Locust Poison. Tests were made in the laboratory last year with this poison using the formula:—

Arsenate of Soda	...	...	1 lb.
Sugar...	...	...	4 lbs.
Water	...	...	8 gal.

The caterpillars devoured this most eagerly, sucking up the drops immediately the liquid was sprinkled near them, and by next day the experimental batch of over a hundred had died to the last one, whilst the control lot of a similar number were all healthy. An opportunity to test this measure in the field has not yet occurred.

Paraffin Emulsion was tried but proved ineffective, probably owing to the lack of hairs on the caterpillar, which would otherwise retain the liquid. Paraffin Emulsion is usually effective against hairy caterpillars and is more suitable for employment in a township than poisoned sweets.

MAIZE SNOUT BEETLE (FURTHER NOTE).—It is comforting to find, as the result of extensive enquiries in different parts of the territory that the damage done by this beetle has been confined to certain farms in the neighbourhood of Salisbury, the insect being unknown elsewhere. Little record of injury in former years has been forthcoming though certain farmers have been familiar with the beetle in small numbers

and no crop other than maize appears to be attacked. The numbers of the pest were very much decreased in the infested fields at the beginning of February and the plants were growing well, but as an indirect result of the beetles' attack they may still suffer from the late planting. It may be mentioned that the insect is probably new to Science, as Dr. Peringuey, of the South African Museum, has been unable to identify it, but assigned it provisionally to the genus *Sciobius*.

EXPLANATION OF PLATES.

Black caterpillar pest (*Laphgma exempta*. Wlk.)

Turnip Sawfly, fig. 1. Adult Sawfly.

„ „ fig. 2. Larvae of Sawfly feeding on turnip leaves.

„ „ fig. 3. Patch of turnips being eaten by Sawby larvae.

„ „ fig. 4. Patch of Kohl-rabi completely devoured by Sawfly larvae.

CHEMICAL.

PORTLAND CEMENT.—The need for a cheap cement in this country is frequently brought to our notice, and as was remarked in a letter recently received from a Bulawayo correspondent, a lucrative income awaits the man who can locate suitable deposits for its manufacture. With the hope that the necessary raw material may be found in Rhodesia, a few particulars are here given regarding the same for the information of those interested, and anyone striking deposits which look promising is invited to send samples thereof, with full particulars, for examination to the Agricultural Chemist, Agricultural Laboratory, Salisbury.

The essential materials used for the manufacture of Portland cement are limestone or chalk and a suitable clay or shale; the limestone, having been pulverised, is mixed with the clay in suitable proportions and burnt, the resulting

product being ground down to the condition in which cement is placed upon the market. In the first place it is of course essential from a commercial standpoint that the limestone and clay or shale should exist in *sufficiently large deposits*, and within reasonable distance of each other and of the railway, to warrant the outlay necessary for the erection of a suitable plant for the manufacture of cement on a commercial scale. Cement of very good quality, which passes the ordinary English tests is now manufactured in the vicinity of Pretoria from a marly limestone—that is a limestone containing naturally some clay in it—and the Pretoria shale. A suitable mixture of these materials, after grinding, is roasted in a rotating cylinder type of furnace heated by water gas, and the calcined product receives a final grinding before being placed upon the market.

For cement manufacture, the limestone used must be of good quality; if it is of a marly character, containing 80 to 90 per cent. of calcium carbonate with the remaining 10 or 20 per cent. consisting largely of clay, it is an advantage. It is not, however, essential that the limestone be marly so long as a suitable river mud or shale can be located. It is very unlikely that a suitable mud similar to that of the Thames and Medway, so largely used for cement-making in England, will be found in sufficient quantity in this country; rather it is thought that we must pin our faith upon finding a suitable shale, so occurring that the expense incurred in bringing the limestone and shale together will not be too great to render the manufacture of cement on a commercial scale impracticable. Degree of hardness has also to be taken into account, those materials which are most easily pulverised will naturally be the most economical to use. When forwarding samples it will be necessary to state the distance between the lime and shale deposits and proximity to the railway. The cost of bringing the raw materials together, apart from their suitability, and of marketing the manufactured article are very important considerations.

In England the cement manufacturer is fortunate in being able to convey the river mud by barges to the works, which are situated upon the river bank with chalk quarries near by,

and the manufactured article can also be placed very cheaply upon the London market by like transport.

The following table gives the chemical composition of Limestone, Clay and Shale used for the manufacture of cement in Natal (D. B. Butler):—

	Limestones.		Clay.	Shales.	
	%	%	%	%	%
Water & organic matter	2.62	2.78	8.47	8.34	9.62
Silica	8.72	6.69	66.51	59.60	56.54
Alumina	0.70	0.46	13.38	20.18	21.64
Oxide of iron			4.41	8.30	9.25
Calcium carbonate ...	84.63	84.53	3.19	1.80	0.68
Magnesium carbonate ...	2.99	5.12	2.18	1.51	1.51
Pyrites	—	—	0.51	trace	trace
Alkalies and loss ...	0.34	0.42	1.35	0.27	0.76
	100.00	100.00	100.00	100.00	100.00

G.N.B.

Reviews.

FARM AND STOCK YEAR BOOK.

(Eastern Province Herald Office, Port Elizabeth.)

We welcome the fifth volume of this annual publication and cordially recommend it to the attention of our farmers, who will find it full of the most useful practical information.

A particularly interesting series of papers are furnished by a number of competent judges on the points of Friesland Shorthorn Ayrshire and Devon Cattle, Thoroughbred and Hackney Horses, Merino and Persian Sheep and Angora Goats, in which both the numbers awarded in judging by points is indicated and the particular characteristics described, showing what to look for and how to appraise properly the points when found. Capital illustrations accompany these instructive articles which deserve the most careful study of all interested in the improvement of stock.

Noteworthy articles are also furnished on the South African cattle industry, by Mr. James Woodin; on mule breeding, by Mr. J. D. Albertyn; on pig raising for bacon, by Mr. W. H. C. Hustler, together with several highly instructive papers dealing with the details of poultry management. Throughout these and the other contents a tone is maintained not over the heads of the readers intended to be benefited, yet thoroughly up-to-date and scientific in the best sense of that much abused term.

E.A.N.

BOOK-KEEPING ON THE FARM.

We have lately received a copy of "The South African Farmers' Book-keeping," by the Rev. W. G. Dowsley, B.A., lecturer in book-keeping at St. Andrew's College, Grahamstown. This work has been written with a view to meeting the South African farmers' need for some simple method of farm accounts, and combines the advantages of a text book with the necessary printed pages for entering up the various receipts and payments. The first four pages are devoted to

explaining and describing in detail, the principles of farm book-keeping, as for instance, "Profit and Loss Account," "Purchases and Sales on Credit," "Stocktaking," etc., etc. Following this are several pages of model accounts, each entry having a marginal number referring to the explanations beforementioned. Finally, examples are given of the annual Profit and Loss Account and Balance Sheet, and the rest of the book, some fifty pages, is ruled and has the necessary headings inserted, so that all that is required is to insert the various receipts and payments in their respective columns.

It is of great importance to the present day farmer to be in a position to ascertain clearly at the end of each season which, and to what extent each branch of the farming operations has been remunerative and which have resulted in actual loss, and this is more particularly so when profits are cut exceedingly fine, as is so often the case. Many farmers rely on their cheque book to shew their financial position, but the practice of keeping exact farm accounts is infinitely more satisfactory and does not entail any great labour.

With Mr. Dowsley's book before him no one should experience difficulty in keeping accurate account of receipts and expenditure, and we have confidence in drawing the attention of Rhodesian farmers to this work. Specimen copies of the "South African Farmers' Book-keeping" can be obtained from Mr. W. M. Sladdin, P.O. Box 103, Salisbury, at a price of 32/- nett.

Another extremely useful little text book on the same subject is "Book-keeping for Farmers," by T. Clark Atkeson, published by the Orange Judd Co., New York, U.S.A., price 1/3. These two publications taken together are sufficient to enable any person, though previously ignorant of book-keeping, to begin and maintain a simple system of farm accounts, and will be of great value to all progressive farmers. As Professor D. W. Sprague of Minnesota University said in a paper read before the State Farmers' Institute "The majority of farmers who claim to keep accounts do so in so unbusinesslike and slipshod a manner that no practical benefit is derived from them. It is just as essential for the farmer to keep a record of his business transactions as it is for the merchant or the banker."

H.G.M.

Cookery for the Country.

(By L. C.)

TINNED LOBSTER, CREAMED.

Open a tin of lobster, drain, and pick to pieces. Boil 2 eggs hard, shell and chop fine. Put into a saucepan 4 tablespoonfuls of butter, and when melted stir in 4 tablespoonfuls of flour; when smooth add 1 teaspoonful grated onion, a pinch of nutmeg, $\frac{1}{2}$ teaspoonful lemon juice, $\frac{1}{4}$ teaspoonful paprika, the same of salt, and a pinch of black pepper, all previously mixed together. Cook smooth and add gradually 3 pints of milk, and stir until a rich creamy mass, then add the lobster and hard-boiled egg, mix, put into a baking dish, cover with crumbs [and pieces of butter and a little grated cheese sprinkled over the top and bake a nice brown. Serve hot.

PEASE PUDDING (A Vegetarian Dish).

Soak a quart of peas in water overnight, in the morning drain off the water and with it any peas floating at the top. Tie up in a pudding cloth, leaving room for them to swell, put them into cold water and boil until tender, about two or three hours. When tender, take them out, drain, and rub through a colander or coarse wire sieve. Mix in two or three ounces of butter, some pepper and salt, and a dessertspoonful of dried powdered mint, flour the cloth well, tie up the pudding in it and boil for another hour, turn out and serve. This is good either, hot, cold or cut in slices and fried.

SAVOURY PUMPKINS.

A good way of making pumpkin interesting is as follows: Take some of the small pumpkins or gourds, boil them for about a quarter of an hour in salted water, then take them out and fill them with the following forcemeat. Soak some crumbs of bread with milk, squeeze, and add the yolks of two hard-boiled eggs and the yolks of two raw eggs, half a dozen blanched almonds, finely chopped, a pinch of powdered cloves, two ounces of grated Parmesan cheese, a little salt,

pepper and a pinch of grated nutmeg. Stew gently in a little butter until quite cooked, and serve with white sauce.

N.B.—A great improvement to white sauce is to stir in just before taking it from the fire a teaspoonful, or a little more of “Rhodesian Cheese de Luxe.”

APPLE CUSTARD.

When apples are in season, peel and core about two pounds of nicely flavoured apples, and let them simmer till they are quite tender in a little more than half a pint of water. Then add half a pound of sugar, a little powdered cinnamon and four well-beaten eggs. Stir the mixture carefully until it begins to thicken in a double saucepan, or in a wide-mouthed jug placed in a saucepan of boiling water. Serve cold in custard glasses with a little cinnamon flavoured sugar sprinkled over the top. Nutmeg can be used instead of cinnamon, if preferred.

RICE AND GINGER FRITTERS.

Boil a small quantity of good rice in milk, add some preserved ginger cut up small, some sugar, and one or more beaten-up eggs sufficient to set it firmly when baked in a pie dish. Bake till set, then cut it into slices, about two inches long, an inch wide and half-an-inch thick; dip each of these pieces in powdered sugar, then in batter, and fry in boiling fat a nice golden brown.

Dates of Meetings of Farmers' Associations, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1911.											
			Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
Rhodesia Landowners and Farmers ...	Bulawayo ...	Harry Hopkins	28	26	30	28	25	29	27	24	29			
Midlands ...	Gwelo ...	M. L. Price	8	13	10	8	12	9	14	11	9			
Mashonaland ...	Salisbury ...	W. H. Williamson	...	1	6	3	5	2	7	4	2			
Manica ...	Umtali ...	P. B. Snashall	...	6	3	1	5	2	7	4	2			
Hartley ...	Hartley ...	H. F. Savory	8	13	10	8	12	9	14	11	9			
Mazoe ...	Mazoe ...	V. W. Fynn	...	...	4	...	...	3	...	...	...
Lomagundi ...	Eldorado ...	P. W. Kidwell	...	20	...	22	...	23	...	25	...			
Marandellas ...	Marandellas	C. M. Wright	...	6	3	1	5	2	7	4	2			
Central ...	Univuma and Enkeldoorn alternately	Rev. A. J. Liebenberg	29	27	24	29	26	30	28	25	30			
North Umtali ...	Summerfield and Nakasaba Mission	R. H. O. Blurten	...	6	...	1	...	2	...	4	...			
Victoria ...	Victoria ...	T. Rutherford	1	...	3	...	5	...	7	...	...	
Victoria (Eastern)	Good Hope Farm	F. A. Readman	19	...	21	...	16	...	18	...	20			
Macheke ...	Macheke	G. F. Kidson	1	6	3	1	5	2	7	4	2			
*Melsetter ...	Melsetter	D. M. Stanley	...	...	...	...	...	...	...	...	...
Gazaland ...	Lower Melsetter	J. W. Scott	6	...	...	6	...	...	5	...	...	
Plumtree ...	Plumtree	J. Reid-Rowland	6	...	1	...	3	...	5	...	7			
Figtree ...	Figtree	J. T. Kirschbaum	13	...	3	...	12	...	...	11	...			
Makoni ...	Rusapi	F. A. Lapham	1	6	3	1	5	2	7	4	2			
Matopo ...	Matopos	W. E. Dowsett	...	...	4	...	...	14	...	...	3			
Makwiro and Norton	Makwiro	F. R. McLellan	...	...	8	...	...	...	...	...	14			
Kimberley Reefs	Kimberley Reefs	G. O. Smith	...	...	4	...	6	...	1	...	3			
Somabula and Shangani Flats	Somabula	S. Annandale	2	6	3	1	5	2	7	4	2			
Headlands ...	Headlands	H. Barnes Pope	1	...	...	...	...	30	...	25	...			
Marula ...	Marula Siding	MacW. Ingram	27	...	29	29	26	30	28	25	30			
North Melsetter	M'Tembarra Mission	N. N. Rutherford	29	27	24	29	26	30	28	25	30			
Lalapanzi ...	Lalapanzi	D. G. Bradford	22	20	17	15	19	16	21	18	16			

* Date Uncertain.

Correspondence.

BONT LEG TICK AND FOOT ROT.

Tom's Hope,
P.O. Stynstroom,
8th March, 1911.

The Director of Agriculture,
Salisbury.

Dear Sir,

Under separate cover I forward you two ticks known, I believe, as the *Pyaemia* tick. This class of tick I have frequently removed from the feet of small stock—their bite produces severe lameness and a festering sore. I am now quite sure on the point but I am of the opinion they are responsible, in a measure, for the disease of Foot Rot. Any information you may impart on the subject will be welcome. I would suggest through the medium of the Journal.

Yours faithfully,
(Sgd.) N. RUTHERFORD.

The Entomologist (Mr. R. W. Jack), furnishes the following reply:—

The tick is known as the Bont Leg (*Hyalomma aegyptium*). It occurs in one or other of its varieties throughout the greater part of Africa. Its bite is a severe one from the size of its rostrum or beak, and is apt to be followed by festering sores as mentioned. Bare patches on the backs of dogs are frequently due to it. The feet or the genital regions appear to be the most favoured spots for it to attack, and in the former situation its presence in numbers may well cause lameness. It attacks all variety of domestic stock and has also been taken in Rhodesia from wart-hog, sable and koodoo. I have taken it in large numbers from the feet of a koodoo bull. In the larval and nymphal stages this tick feeds on birds and hares chiefly, attaching to the region of the head. It does not appear to attack the larger animals in

this stage. It requires only two hosts in the course of its life circle as it does not leave its first host for the moult from larva to nymph.

The Veterinary Bacteriologist (Mr. Bevan) adds this note:

The so-called "Pyæmia tick" which causes a pyolymphangitis in equines in some parts of Rhodesia differs considerably from the "Bont leg tick" sent by Mr. Rutherford, which, as he says, frequently gives rise to abscesses and sores on the feet of small stock. The "Foot rot" so caused is non-contagious, and *not* the specific form of "Foot rot" which is a contagious inflammation caused by the *Bacillus necrophorus* which is present in the discharges from the diseased tissues, and when introduced by inoculation into the bodies of healthy sheep produces the disease in fourteen to twenty-one days. The infective discharges coming into contact with sound feet will also give rise to the disease. When treating the injuries set up by the tick it is advisable to use some remedy which being repugnant to ticks will prevent further cases. A mixture of finely divided blue-stone and Stockholm tar may be applied for this purpose, or the sheep may be driven frequently through a long, shallow and narrow trough containing the following mixture:—

Soft soap	...	...	2 ounces
Paraffin	...	...	6 "
Bitter aloes	...	...	1/2 "
Arsenite of soda	...	...	2 1/2 "
Water	...	...	8 gal.

The soap, aloes and arsenic are boiled up in a gallon of water. The solution is removed from the fire and the paraffin is added. This solution having been beaten up into an emulsion is added to the remaining water.

MISS MAIDMENT'S REPORT.

Maritzburg Farm,

Figtree,

2nd March, 1911.

To the Editor *Rhodesia Agricultural Journal*.

Dear Sir,

I notice in Miss Maidment's report on dairying in Rhodesia that she states "Friesland cattle give such a poor

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Dear Sir,

I notice in Miss Maidment's report on dairying in Rhodesia that she states "Friesland cattle give such a poor

quality of milk and butter that they are not to be recommended." Friesland cattle are so popular all over S. Africa and are kept in such large numbers that they may well be called the dairying breed of the country. They have not kept their popularity for so long a time without very good reason, which is that they are good milkers, giving a large quantity of milk of good quality the butter from which leaves nothing to be desired, are thrifty, doing well on poor veldt, such as is so often found in the Colony, and throw first-class heavy bullocks.

Miss Maidment's Figtree lecture and demonstration was held at our homestead, and the milk she used was from Friesland cattle; we keep no other breed. She tested the milk and it gave 4 per cent. of butter fat. The milk was a general sample of the whole and from no particular cow.

S. African bred Friesland cattle will probably be the dairy breed of Rhodesia in spite of all we hear of the merits of various English breeds, and Miss Maidment's statement should not, I think, go unchallenged. As a dairy expert she is most likely excelled by no one, but as an expert on what dairy breed we should keep in Rhodesia, only long residence and experience in the country could qualify her to speak with authority.

Yours faithfully,

A. CURTIS.

(NOTE.—We are given to understand that all the milk used at the Salisbury demonstrations by Miss Maidment was also obtained from Friesland cows.—ED., R.A.J.)

Weather Bureau.

TEMPERATURES.

STATION.	JANUARY.		FEBRUARY.	
	Max.	Min.	Max.	Min.
Bulawayo	76·9	61·2	77·9	59·7
Chishawasha	77·2	60·7	76·4	59·7
Empandeni	79·7	61·9	81·3	60·6
Gwelo	77·1	59·4	78·1	56·7
Hartley	81·0	62·2	81·4	60·7
Hope Fountain	76·7	60·6	77·1	58·3
Kariyangwe ... ..	...	...	...	...
Matopo Park	78·7	63·4	80·3	57·6
Melsetter	73·5	...	72·3	...
Mount Selinda	76·6	62·1	75·1	59·9
Plumtree	75·8	59·6	78·6	59·8
Salisbury	76·6	58·6	76·2	57·5
Shamva Mine	79·7	...	79·1	...
Sinoia	*83·3	*60·2	70·5	59·2
Tuli	88·1	...	89·5	...
Umtali ... ..	...	...	81·6	41·5
Victoria	79·1	63·3	79·1	60·4
Victoria Falls	83·8	65·1	84·0	64·1
York Farm, Inyanga	69·9	55·2	72·4	53·9

* Observations taken for 24 days only.

RAINFALL.

STATION.	January	February
MASHONALAND—		
Banket Junction	6·84	9·50
Charter	11·94	7·61
Charter (Range)	14·21	7·70
Chicongas Location	15·56	5·82
Chilimanzi	14·31	...
Chiningo	9·35	9·00
Chishawasha	9·24	7·69
Darwin	10·53	12·34
Eagle's Nest	11·79	7·36
Eldorado	14·36	12·05
Enkeldoorn	9·00	4·90
Gatooma,	9·90	8·25
Gatooma, Railway Station	9·48	7·69
Gadzema, Giant Mine	8·67	5·77
Gutu	12·14	5·57
Hartley	8·15	3·83
Hartley, Gaol	9·11	4·31

RAINFALL—continued.

STATION.				January	February
MASHONALAND—(Continued)					
"Hallingbury" Farm	...	...	...	8'64	3'09
Inyanga Police Camp...	...	...	...	16'38	9'09
Kanyemba	...	...	...	10'96	5'98
Lone Cow Estate	...	...	...	8'16	11'60
Macheke	...	...	...	9'86	7'53
Makwiro	...	...	...	11'51	3'89
Marendella	...	...	...	12'98	5'56
Monte Cassino	...	...	...	13'09	5'68
Mazoe, Brundret Farm	...	...	...	6'08	10'62
" Native Commissioner's Office	...	...	...	7'92	12'42
Meadows Farm	...	...	...	8'80	8'60
Melsetter, Government Offices	...	...	...	16'40	6'76
" Farm Helvetia	...	...	...	15'96	9'17
" Mount Selinda	...	...	...	16'51	...
" Farm Vermont	...	...	...	21'72	9'24
" Farm Grassfell	...	...	...	28'01	18'12
Morgenster	...	...	...	19'76	6'32
Mrewa	...	...	...	9'38	14'73
M'toko	...	...	...	8'29	6'72
N'Danga, Pamnshand...	...	...	...	14'63	6'56
Rusapi, Police Camp	...	...	...	15'77	...
"	...	...	...	14'66	8'02
Salisbury	...	{	Gaol	6'24	6'76
			Laboratory	5'84	5'70
			Public Gardens	5'44	6'59
			Railway Station	6'17	6'64
Shamva	...	...	...	8'51	14'91
Sinoia	...	...	...	8'98	9'54
Summerfield Farm	...	...	...	18'50	8'67
Umtali	...	...	...	*	7'73
Utopia Farm	...	...	...	18'60	8'09
Umvuma, Griefontein Farm	...	...	...	10'03	7'63
" Grootfontein Farm	...	...	...	9'40	8'77
" Railway Station	...	...	...	9'63	10'03
Victoria	...	...	...	13'14	...
Victoria Falls	...	...	...	15'49	7'00
" " Police Camp	...	...	...	15'06	7'00
Westridge, Salisbury	...	...	...	5'74	...
MATABELELAND—					
Balla Balla	...	...	...	12'96	4'30
Bembezi	...	...	...	8'62	7'47
Broken Hill	...	...	...	9'76	...
Bulawayo	...	{	Observatory	8'21	10'04
			Government House	9'04	7'17
			Raylton	8'79	8'97
Empandeni	...	...	...	8'55	10'54
Filabusi	...	...	...	9'06	3'46
Globe & Phoenix	...	...	...	7'33	6'96
Gwaai	...	...	...	8'16	8'97
Gwelo	...	...	...	7'22	...
" Railway Station	...	...	...	4'00	5'40
" Showlands	...	...	...	7'70	10'78

*Records taken for two days only.

RAINFALL—*continued.*

STATION.	January	February
MATABELELAND—(Continued)		
Heaney Junction	10'00	5'20
Hope Fountain	10'54	...
Insiza	9'75	...
Inyati	11'48	5'79
Kafue Railway Station	7'59	...
Malindi	9'78	5'52
Marula	12'91	3'53
Matopo Mission	12'94	8'18
Matopo Park	10'84	5'13
Maxim Hill Farm	10'12	6'25
Mtshabzi Mission	10'58	3'63
Nyamandhlovu	7'74	7'95
Plumtree	5'40	6'50
Que Que	9'68	7'61
Rixon	8'41	6'44
Selukwe	12'11	11'23
Solusi	10'22	6'69
Syringa	5'69	5'66
Tegwani	5'83	3'77
Tuli	4'90	2'70
Umguza	9'10	3'83
Wankies (Railway Station)	8'92	6'75
West Nicholson	15'90	4'50

Agricultural Reports for January and February, 1911.

The rainfall has on the whole been copious and in some instances heavier than for several years past, but somewhat erratic with spells of dry weather. This has checked the crops at a critical time in the principal grain growing areas so that there is a prospect of a somewhat lighter crop than last year which as it will be remembered exceptionally good but the increased acreage is likely to more than make up for any deficiency.

In low-lying land, on the other hand, slight damage has been done by torrential rains. Native crops suffer more than those of Europeans, owing to the better cultural methods of the latter. Mazoe has suffered in both respects, and also from mildew in maize, popularly known as rust, and aphid has injured native maize in Kanyemba district. On the whole, however, European and Native crops do well, and are reported to be very good throughout the rest of Mashonaland.

Crops were, on account of the weather, sown rather later in Matabeleland than usual, and are consequently backward.

With the exception of the Belingwe and Sebungwe District, where the rains were very late, the crops in Matabeleland are favourably reported on.

CROPS.

Reports received indicate increased attention being paid both by white farmers and native to the cultivation of Monkey Nuts. This is very desirable as there is a good and constant market for this product on the mines; while if grown in a sufficiently large quantity there is every prospect of a remunerative industrial outlet for this article by the establishment of an oil crushing factory. But a sufficient supply is the first desideratum.

Rice, a native crop, which of recent years has been less grown than formerly, is again being heard of, particularly in the Gutu district, where the season has been very favourable to it.

Owing to continuous rains natives have neglected to hoe their lands and weeds are more than usually prevalent this season. The same is true in a less degree of farm lands.

STOCK.

In connection with sporadic outbreaks of Coast Fever general prohibition of movement over wide regions has been in force, and later restricted to smaller areas as soon as the affected zones could be defined. These restrictions have been generally readily complied with, the public realising that it is the best safeguard in the general interest. The general condition of stock is excellent, the veld everywhere being good.

Lions seem to have been in general evidence during January and numbers have been killed.

Lightning too has caused not a little loss amongst native owned cattle.

Veterinary Report for January and February, 1911.

BULAWAYO.

AFRICAN COAST FEVER.—On the 17th February, the Government Veterinary Surgeon reported that Coast Fever had broken out amongst a large herd of cattle on Sauerdale belonging to Mr. Huntley. The distance between this herd and the nearest point of infection in Mzingwane District is about 12 miles. Prior to the date mentioned several animals had died but the existence of Coast Fever was not suspected and no report was made.

On the 20th February, the disease was reported from Colonel Napier's farm Springs, which adjoins the infected area on the Mzingwane Native Reserve. During the preceding two months several cases of sickness had occurred, but Coast Fever was not suspected.

The removal of both these herds, comprising nearly one thousand head of cattle, to temperature camps on clean veld was immediately begun.

On Copthall Block the disease appeared in a native kraal near to the Southern Boundary, and it was decided to remove all cattle from the Block to clean veld on Essexvale. This work is now in progress.

On the 28th February, the Chief Veterinary Surgeon and Government Veterinary Surgeon Edmonds destroyed a cow at a native kraal on Hope Fountain, which lies between Sauerdale and Mzingwane. Post-mortem examination shewed typical lesions of African Coast Fever. This cow had been under observation for twenty-four days, and blood smears were regularly examined. Except on one occasion when the report stated that a few intra corpuscular bodies, identity uncertain, were present, there were no appearances of Coast Fever. Spleen smears taken at the post-mortem examination proved negative.

An outbreak occurred at a native kraal on the farm Ballarat. This herd and the one on Hopefountnin are under observation preceding removal to clean veld.

MALLEIN TEST.—The following animals were tested on entry :—

Horses	...	...	41
Mules	...	...	190

One mule reacted and was destroyed.

SALISBURY.

AFRICAN COAST FEVER.—An outbreak occurred at the farm Tynwald. An ox was noticed sick and immediately stabled, but several days elapsed before Coast Fever was diagnosed by microscopic examination of blood preparations.

This farm adjoins the previously infected areas on Stamford and the Outspan, which were denuded of cattle, the former nine months and the latter four months ago. The probable explanation of the present outbreak is some slight infection dropped on Tynwald before the erection of the fences around Stamford and the outspan.

The cattle were passed through a temperature camp and are now confined to the eastern portion of the farm, no other clean veld being available.

GLANDERS.—A suspected case of glanders occurred on Stand 64, Salisbury. After the application of the mallein test, which shewed the existence of glanders, the animal was destroyed. All in contact animals were tested, one re-acted typically and was destroyed and four were detained for a further test. Before the application of the second test, one animal developed glanders. At the second test one of the remaining three reacted and was destroyed.

SELUKWE.

In January several deaths occurred amongst four small herds of cattle belonging to the B.E. Co. on Riversdale and Aberfoyle Block. Post-mortem and microscopic examination revealed no symptoms of Coast Fever except in one instance,

viz., spleen smears from a cow which died on the 12th January shewed Koch's bodies.

On the 27th January, the Chief Veterinary Surgeon visited the suspected herds. Two animals in the same herd as the cow referred to which had been sick for five and six days respectively were destroyed, but post-mortem examinations did not shew the least suspicion of Coast Fever, and microscopic examination of blood spleen and gland preparations proved negative. The herd was temperatured, those shewing normal reactions were removed to a new camp and those shewing fever detained. From the former several animals were subsequently drafted back on shewing a rise of temperature, but after a few days the temperatures fell to normal.

Blood and gland preparations from the affected animals were regularly submitted for microscopic examination, but so far the only parasites demonstrated have been those of piroplasmosis and anaplasmosis.

The accuracy of the diagnosis in this has been questioned. Whilst the smears undoubtedly shewed Coast Fever, it is possible that they came from another district, but full enquiry failed to shew that there was any confusion of the large number of smears which arrived on the date of receipt of those from Selukwe.

The animals affected were chiefly North Western Rhodesian stock, brought to Aberfoyle and Riverside about six months ago. About seven weeks before the first cases occurred a half bred shorthorn colonial bull was introduced into the herd. Since then he has been ill on several occasions from anaplasmosis.

RUSAPE AND INYANGA DISTRICTS.

AFRICAN COAST FEVER.—Several fresh outbreaks occurred at native kraals near the Inyanga-Rusape road and amongst a small lot of cattle at Rusapie Station.

At the Inyanga Estate although the cattle have been moved to clean veld several times, the disease has not been eliminated. The Government Veterinary Surgeon in charge reports that in some animals the disease runs a sub-acute

course without any rise of temperature; three such cases have been noticed and in each post-mortem examination shewed typical Coast Fever lesions.

HARTLEY.

FLY DISEASE (*Trypanosomiasis*).—The cattle inspector reports that no deaths or suspected cases were reported as compared with 7 deaths and 18 proved cases during corresponding month of 1910. He also reports that big game are less plentiful, but that tsetse flies are just as plentiful as last year.

UMTALI.

An outbreak of Redwater amongst Mr. Strickland's cattle on the farm N'odzi.

MAZOE.

Amongst the cattle on the Belford Estate 32 deaths occurred. Arsenical poisoning was suspected, but analysis of stomach contents did not show any traces of arsenic. The affected animals showed no symptoms of illness except general weakness and died a few hours after being taken ill. The only post-mortem appearances were congestion of the mucous coat of the first stomach, and the second stomach was dotted with small erosions about 200 in each case.

The herd was removed to clean veld and the mortality ceased shortly afterwards.

In May, 1908, about 40 head died practically on the same ground and with similar symptoms. The cause is probably some undetermined vegetable poison.

GWANDA.

An outbreak of glanders occurred at the Anterior Mine, 1 horse and 1 mule were destroyed, and all Incontacts tested with mallein.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

Salisbury,

April, 1911.

Market Reports.

Messrs. Fear, Colebrook & Co., Ltd., of Southampton, report that the Home market is dull and prices generally rather easier. The following are the latest prices given by this firm:—

Yellow round maize, 21/6 to 22/- per 480 lbs. c.i.f., or equal to 7/11 to 8/1½ per bag free on board South African ports.

Red wheats, 29/- to 34/-, white wheats, 32/6 to 34/- per 480 lbs. c.i.f.

River Plate oats, 12/9 to 13/- per 304 lbs. c.i.f. to the United Kingdom, or equal to 5/2 to 5/3½ per bag free on board South African ports.

There is nothing special to report as regards the local market.

The following firms have kindly supplied prices:—Messrs. Fear, Colebrook & Co., Ltd., Southampton; Messrs. Jas. Lawrence & Co., Ltd., Kimberley and Johannesburg; Messrs. Wightman & Co., Ltd., and Messrs. Whitfield & Co. of Salisbury.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	12/0 13/6	9/6 12/6	—	27/6 30/0
Beans, per 200 lbs. ...	—	—	—	32/6
Beans, Sugar ...	25/0 27/6	20/6 30/6	—	—
Beans, kafir, per 203 lbs.	15/0 20/0	20/0 25/0	—	—
Boer Meal, unsifted, per 200 lbs. ...	—	23/6 25/6	—	41/6 45/0
Boer Meal, sifted, per 200 lbs. ...	23/8 25/6	26/0 28/6	43/0 44/0	42/6 47/6
Bran, per 100 lbs. ...	6/3 6/6	5/9 6/0	14/0 14/6	16/0 17/0
Flour ...	—	—	—	17/6 25/0
Flour, Colonial 100 lbs.	—	15/6 16/6	22/6 23/0	—
Forage, T'vaal, 100 lbs.	—	—	—	—
" O.R.C. "	—	—	—	—
" Colonial "	—	4/6 5/0	—	—
" Oat "	4/3 4/9	—	6/6	10/6 12/0
Hay, per bale ...	—	—	—	3/6 4/0
Kaffir Corn, White, per 200 lbs. ...	10/9 10/3	12/6 14/0	8/0 8/6	—
do. Mixed 200 lbs.	10/6 10/9	—	—	—
Manna, per 100 lbs. ...	—	—	—	—

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Mealies, S.A., White per 200 lbs. ...	8/10 9/2	12/6 13/6	10/6 11/0	8/6 10/0
Mealies, S.A., Yellow, per 200 lbs. ...	9/6 9/9	—	9/0 9/6	—
Mealie Meal, White, per 200 lbs. ...	—	8/6 9/3	—	—
Manga, per 200 lbs. ...	—	—	—	10/6 12/0
Monkey Nuts, per lb. ...	—	—	3½d. 4d.	—
Oats, per 150 lbs. ...	7/6 8/9	9/6 10/0	—	22/6 25/0
Onions, per 120 lbs. ...	8/6 10/0	5/0 10/6	20/0 21/6	20/0 25/0
Peas, per 200 lbs. ...	—	—	—	—
Potatoes, per 150 lbs. ...	4/6 5/6	5/0 16/0	9/0 14/0	10/0 11/6
" O.R.C. ...	—	—	—	—
" New ...	10/0 11/3	—	—	—
Rapoko ...	—	—	—	10/6 11/0
Rye, per 200 lbs. ...	9/6 10/0	—	—	—
Salt, per 200 lbs. ...	—	3/0 4/0	9/0 9/6	16/6 17/6
Tobacco, good, per lb ...	3½d. 5d.	4d. 7d.	—	—
" inferior, per lb ...	—	1d. 2d.	—	—
Wheat, per bag 203 lbs. ...	16/6 19/3	18/6 20/6	—	30/0 31/0
Butter, per lb. ...	11d. 1/0	11d. 1/2	1/0 1/6	1/6 2/6
Butter, second quality ...	9d. 10½d.	8d. 10d.	—	—
Eggs, per doz. ...	1/6 1/7½	1/0 1/9	2/9 3/7	—
Ducks, each ...	1/9 2/6	2/0 3/0	3/6 3/9	4/6
Fowls, each ...	2/0 2/3	1/0 2/0	1/3 2/1	4/6
Geese, each ...	3/3 3/9	—	—	12/6
Turkeys, each ...	9/6 15/0	5/0 15/0	8/3 9/6	£1
Oranges, per 100 ...	—	—	—	—

LIVESTOCK.

Horses ...	£12 £25	£10 £25	£15 £20	£25 £30
" Mares ...	—	—	£17/10	—
Mules ...	£17/10 £25	£20 £25	—	£30
Donkeys, geldings ...	£5 £6/10	£4/10 £7	£7 £8	—
" mares ...	—	£5 £7/10	£9 £10	—
Cows, Dairy ...	—	—	£25 £35	£25 £30
Cows, Native ...	—	—	£7/10 £9/10	£10
Heifers, Colonial ...	—	—	£8 £17/10	—
Heifers, Native ...	—	—	—	—
Oxen, Trained ...	—	£7 £8	£8/10 £11/10	£10
Oxen, Ordinary ...	—	—	—	—
Cows, Slaughter ...	£6 £7/15	£7 £8	—	—
Oxen, good ...	£11 £13/10	£10/10 £13/10	—	—
Oxen, medium ...	—	£8 £10	—	—
Calves, ...	—	£2 £3/10	—	—
Sheep, ...	—	14/0 17/0	14/0 20/0	£1
Lambs, 30 lbs. ...	8/0 10/6	8/0 10/0	—	—
Hamelts ...	16/6 19/0	12/6 17/6	—	—
Kapaters ...	—	—	—	—
Pigs, clean, per lb. ...	—	d. 3½d. 3	4d.	4d.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught; feeding and kraaling of live stock; hints on the principles of cattle breeding.

Chemistry.—The principles of soil fertility; The principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing.)

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

DISTRIBUTION OF WINTER CEREALS.

The undermentioned winter cereal seeds will be available for free distribution, free on rail Salisbury, under the usual terms of Co-operative Experiments, during the months of March, April and May.

Not more than four or five kinds can be issued to each applicant, and the weight of the seed of each kind will be from 15 to 20 lbs. The successful results which have already been obtained with winter cereals when sown on naturally moist soil without irrigation, justify the hope that any of those below mentioned are likely to prove satisfactory and are certainly well worth trial under such conditions.

Those marked with an asterisk are thought to be specially suited to non-irrigated land,

WHEAT.

Bobs.

Klein koren.

Du Toit's koren.

*Early Gluyas.—Very early.

*Golden Ball.

*Medeah.

OATS.

Algerian.

*New Zealand. (A late kind, giving a stout feeding oat.)

*White Tatarian.

*Sidonian.

BARLEY.

*Nepal barley wheat.

*Chevalier malting barley.

RYE.

*Early Rye.

*Mammoth late winter. Under certain conditions, this variety if sown early, can be fed off by stock in mid-winter and allowed to run into ear in early spring.

Applications should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, and should be accompanied by full particulars as to the method of forwarding which is desired.

In the case of consignments to be sent by Parcel Post or addressed to a siding, on which charges must be prepaid the applicant should enclose cheque or post office order to defray such expenses.

TOBACCO SEED.

All enquiries for tobacco seed should be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Fencing Loans Committee, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Committee, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Loans Committee to the Director of Agriculture, Salisbury.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may obtain pure bred stock for breeding purposes through the Department of Agriculture.

The stock is selected in South Africa by a competent official buyer and payments up to a total value of £75 may be made by instalments spread over one year, a deposit being made in the first instance, one third of the purchase price on delivery, one third after six months and the balance a year after purchase. The Government meet risks in transit and until delivery is effected. For larger amounts cash payments are required.

Purchasers of single or a few animals require to wait until truck-loads can be made up in order to reduce the charges for railage. Recent purchases have included cattle of several

breeds, rams and ewes and pigs. Applications for high class stock only will be considered.

Special arrangements have been made for the purchase of stock in England or Europe.

Fuller particulars may be obtained on application to the Director of Agriculture, Salisbury.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an officer deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars, together with plans and specifications, can be obtained.

DESTRUCTION OF WILD CARNIVORA, ETC.

The undermentioned rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£7 10 0
„ Leopard	£1 0 0
„ Cheetah	£1 0 0
„ Hyæna	£0 10 0
„ Wild Dog	£0 10 0
„ Crocodile, of not less than 3ft. in length	£0 10 0
„ Baboon	£0 2 6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of a Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of a Hyæna, Crocodile, Wild Dog or Baboon, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.

Winter Feeding of Farm Stock, by H. Godfrey Mundy, F.L.S.

Ensilage, by H. Godfrey Mundy, F.L.S.

The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.

The Preservation of Butter.

Rhodesian Standard Types of Maize and their points, by H. Godfrey Mundy, F.L.S.

Requirements in sending Botanical Specimens to the Department for Identification.

The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc.

Agricultural Co-operation in Rhodesia, by P. J. Hannon.

Special Railway Rates for Benefit of Farming Community.

Plans and Specifications of Flue Curing Barns.

Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.

Hints on Irrigation—Small Gravitation Schemes—by W. Martin Watt, Government Agricultural Engineer.

Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., Government Agricultural Chemist.

Instruction in Dairying, by Miss E. A. Maidment.

Hints on Irrigation—Small Earthen Reservoir—by Wm. Watt.

Winter Cereals, by H. Godfrey Mundy, F.L.S.

CROPS.

- How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
- Cotton Cultivation, by J. L. Stinson.
- The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
- Maize Growing, by H. Godfrey Mundy, F.L.S.
- Onion Growing, by H. Godfrey Mundy, F.L.S.
- Tobacco, by G. M. Odum.
- Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S. ;
- Notes on Tobacco Culture:
Bulletin No. 5;
- Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.
- Flax-Linum Usitatissimum, by C. E. F. Allen.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- Onion Thrips, by R. W. Jack, F.E.S.
- "Foul Brood " in Bees, by Rupert W. Jack, F.E.S.
- The Potato Tuber Moth, by Rupert W. Jack, F.E.S.
- The Tsetse Fly, by Ll. E. W. Bevan, M.R.C.V.S.
- Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.
- The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.
- The Head Smut of Maize, by H. Godfrey Mundy, F.E.S.
- Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.
- Black Orange Aphis, by Rupert W. Jack, F.E.S.
- Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.
- Regulations affecting the Importation of Potatoes. by Rupert W. Jack, F.E.S.
- Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by W. Jack, F.E.S.

VETERINARY.

- Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
- Wireworm, or Hairworm, in Melsetter District, by E. M. Jarvis, M.R.C.V.S. ;
- Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.
- Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S., and M. F. McGregor.

African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition).

Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.

Strangles, by F. D. Ferguson, M.R.C.V.S.

Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

The Construction of Dipping Tanks for Cattle.

Animals Diseases Consolidated Ordinance, 1904.

Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.

Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.

How to make use of the Fencing Ordinance, 1904, by N. H. Chataway.

Loans for Fencing.

The Time and How to Find it, by Rev. Father Goetz, S.J.

Rural Education in Rhodesia, by G. Duthie, M.A., B.A., F.R.S.E.

Game Law: Summary of.

Services of Agricultural Engineer.

Lectures for Farmers.

Animals Diseases Amending Ordinance, 1911.

Government Notice.

No. 85 of 1911.]

[16th March, 1911.]

IT is hereby notified for public information that the subjoined Ordinances, entitled

“Additional Appropriation 1910-11 Ordinance, 1911,”

“Animals Diseases Amending Ordinance, 1911,” have been assented to by His Excellency the High Commissioner, and are hereby published in terms of the 36th section of the Southern Rhodesia Order in Council, 1898.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the “Animals Diseases Consolidated Ordinance, 1904” (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term “owner” shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly

on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South

Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly

disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out."

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word "obtained" in the twelfth line of the said sub-section, "and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained."

20. This Ordinance may be cited as the "Animals Diseases Amending Ordinance, 1911," and shall be read as one with the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amendment Ordinance, 1910."

No 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by

the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

- (1) Plumtree shall be regarded as the port of entry.
- (2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.
- (3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

- (1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.
- (2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.
- (3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards

distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roads distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Pro-

proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district ofin the
.....Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on.....
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

.....
Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent.....

Owner's name and Address.....

Place in Southern Rhodesia to which animals are being sent.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOV- ERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my
opinion, free from any destructive disease, including scab, and to the
best of my knowledge and belief have not been in contact with any in-
fected animals nor come from, or through, a locality where any such
disease is known to exist or has existed for twelve months from date
hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.]

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
 Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 60 of 1911.]

[23rd February, 1911.

IMPORTATION OF SHEEP AND GOATS FROM
THE CAPE OF GOOD HOPE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section I of the Regulations published under Government Notice No. 295 of 1908 by the insertion of the words "or Examiner of Stock" immediately after the word "officer" where it occurs in the said section.

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official

destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant

Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);

ii. Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);

ii. Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

I. **O**N and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-

rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. „ „ bulls „ „	0	5	0
d. „ „ donkeys „ „	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such

work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass

Straw

Hay

Lucerne Hay

Forage

Green Lucerne

Sugar Cane

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
- [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.
- Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
 5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
 6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....

Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....

Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazeley	Thornviei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to

import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.....

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 229 of 1910]

[17th August, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

[18th August, 1910.

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramaquabane Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm 'Lewisdale,' thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-Macbutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederæ*)
- The Circular Purple Scale (*C. aonidum*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beckii*)
- The Long Scale (*L. gloverii*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizonura lanigera*).

No. 329 of 1910.]

[15th December, 1910.

AFRICAN COAST FEVER.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

1. Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw

Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof.

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;
- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9. From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farms jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railway line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle—

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....
Bulls.....
Oxen.....
Young Stock.....
Calves.....
Cause of decrease.....
Cause of increase.....
Name of farm.....

(Owner's Signature.)

No. 33 of 1911.]

[2nd February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in accordance with section 16 of Government Notice No. 329 of 1910, declare the following areas to be actively infected with the disease known as African Coast Fever:—

Farm Hayden,	Goromonzi district.	
Farm Tilbury,	Melsetter district.	
Farm Aberfoyle,	} Selukwe district.	
Farm Brooklands,		
Farm Riversdale,		

No. 59 of 1911.]

[23rd February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in accordance with section 16 of the Regulations published under Government Notice No. 329 of 1910, I do hereby declare the whole of the native district of Matobo to be an area actively infected with the disease known as African Coast Fever.

No. 34 of 1911.]

[7th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 16 of Government Notice No. 329 of 1910, by the addition of the following clause:

"Provided, however, that cattle intended for slaughter purposes may be removed to a centre of consumption under the conditions of section 6 hereof, and under such other conditions as may be prescribed by the Chief Inspector of Stock."

No. 14 of 1911.]

[12th January, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 163, 281 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

1. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

(b) The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—
Bitton, Syston.

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

- (d) The native district of Inyanga.
- (e) The native district of Makoni.
- (f) The native district of Umzingwani.
- (g) The following farms in the native district of Insiza :—

Centrebank,	York,	Kildare,	Lincoln,
Woodhouse,	Kogha,	Eldorado,	Bonnybrook,
Fairview,	Outspan No. 3,	Lancaster,	Blagdon,
Idutwa.			

2. The following area is defined for the purposes of section 17 of the said Notice, viz. :—That portion of the native district of Goromonzi lying west of and including the following farms :—

Borrowdale, Springs, Stuhm, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruua River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information :—

" 16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

" 17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule "A" being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following :—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imbeza Plots.

MOVEMENT OF TRANSPORT CATTLE.

NOTICE is hereby given that petitions have been received by His Honour the Administrator for permission to employ cattle for draught purposes in the undermentioned areas. Any objections thereto must be lodged with the undersigned on or before the 21st March, 1911, and should contain particulars of the number and value of cattle on the farms represented by the objectors, together with any reasons for such objections.

GADZEMA STATION.

An area in the native district of Hartley, bounded by a line drawn from the confluence of the Umsengaisi and Umfuli Rivers, up the latter to the drift on the old Hartley-Salisbury Road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to the boundary of the native district of Lomagundi at a point where the Hunyani River enters it at the Hunyani Poort; thence westwards along this boundary line to the point first-named.

MAKWIRO STATION.

An area in the native district of Hartley bounded by a line drawn from a point on the Umfuli River at the drift on the old Hartley-Salisbury Road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to the boundary of the native district of Lomagundi at a point where the Hunyani River enters it at the Hunyani Poort; thence up the Hunyani River to the western boundary of the Hunyani Estate; thence along the western and southern boundaries of that estate to the north-western beacon of Railway Farm No. 29; thence along the western boundary of that farm and the eastern boundary of Railway Farm No. 28, Makwirow Source and Ardmore; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and down that river to the first-named point.

NORTON SIDING.

An area in the native district of Hartley, bounded by a line drawn from the junction of the Gwibi and Hunyani Rivers, along the eastern boundary of the Hunyani Estate; thence along the north and western boundaries of Railway Farm No. 29 and the eastern boundaries of Railway Farm No. 28, Makwirow Source and Ardmore; thence in a straight line to the north eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and up that river to the eastern boundary of the native district of Hartley; thence northwards along the boundary to the Hunyani River, and down that river to the first-named point.

MARANDELLAS (NORTH).

An area including the following farms;—Musi, Peddi, Southampton, Roraima, Essexvale, Rockery, Progress, that portion of Lendy north of the railway line, Longlands, Shortlands, Loquat Grove, Helm, Cotter, Rapid, Revolt, Rakodzi, Springvale, Retreat, Pirate, Bovey Tracey, March, Rocklands, Forest Range, Cornwall, Somerset, Dorset, Buckingham, Sunny Fountains, Mangwendi Mission, Tiller, Rapture, Warwick, Cambridge, Nandu, Argosy, Rapture, Dormervale, Oxford, Norfolk, Surrey, Sussex, Suffolk, Kent, Middlesex, and that portion of the Mangwendi Native Reserve bounded by a line drawn from the north-eastern beacon of Sussex along the northern boundary of that farm, Suffolk, Kent and Middlesex; thence for six miles down the Inyagui River; thence in an easterly direction to the junction of the Samanoya and Inyakambiri Rivers, and up the latter to the north-eastern beacon of Sussex.

Note.—Access is proposed to be granted for ox transport from the above-described area on to Uplands, subject to the condition that no such wagons be outspanned on the south side of the railway.

MARANDELLAS (SOUTH).

An area bounded by a line drawn from the most northerly beacon of Gatzi, along the western boundary of that farm and Nolans and the southern boundary of Retreat, Springvale, Rakodzi, Longlands, and from the southernmost beacon of that farm along its western boundary to the railway; thence westwards along the railway to where it enters Peddie; thence along the south-eastern and south-western boundaries of Peddie and the eastern and southern boundaries of Musi and the western boundary of Hedon to the headwaters of the Sandspruit; thence down that river to the boundary of the native districts of Marandellas and Hartley, and along that boundary to the north-western beacon of Erdington Estate; thence along the northern boundaries of that farm, Glynn, Bucknall and Pinhoe, and along the western boundaries of Balmoral, Corfe, Vergenoeg and Good Hope; thence down the Sabi River to its confluence with the Machiki River, up the latter to the south-eastern beacon of the farm Mere; thence along the southern boundaries of that farm and Cave; thence along the eastern boundaries of Delta, Sashini Reserve, Deay, Boom, Tarara and Gatzi to the starting point.

Note.—Access is proposed to be permitted for draught oxen from the ox transport area immediately to the north of that herein described on the Uplands, provided such wagons are outspanned only to the north of the railway.

MACHEKE STATION.

An area including (1) the native district of Mtoko; (2) that portion of the native district of Mrewa east of the Nyakambiri River and of the Shewanoya River below its junction with the Nyambiri River; (3) that portion of the native districts of Marandellas and Makoni bounded by a line drawn from the north-western beacon of Showers, along the western boundaries of Showers, Gongwe, Magar, northern and western boundaries of Highlands, north-western and south-western boundaries of Allen, western boundary of Holton, western and southern boundaries of Belmont Outspan, north-western boundary of White Gombola, western boundaries of Bonn, Calne, Wilton, western and southern boundaries of The Cave, and southern boundary of Mere; thence up the Machiki River to the north-western corner of Helenvale; thence along the eastern boundary of the Fairfield Estate to the north-western beacon of Moria; thence direct to the south-eastern beacon of Changwe Ranche No. 1; thence along the eastern boundaries of Changwe Ranche No. 1 and No. 2 to the Mafuri River; thence along the boundary of the Mrewa district to the starting point.

MOVEMENT OF TRANSPORT CATTLE, HARTLEY DISTRICT.

NOTICE is hereby given that petitions have been received by His Honour the Administrator for permission to employ cattle for draught purposes in the under-mentioned areas. Any objections thereto must be lodged with the undersigned on or before the 14th March, 1911, and should contain particulars of the number and value of cattle on the farms represented by the objectors, together with any reasons for such objections.

HARTLEY STATION.

An area in the native districts of Hartley and Charter, bounded by a line drawn from the junction of the Umfuli and Umshigarri Rivers, up the latter to its source; then in a straight line to the most northern beacon of Railway Farm No. 12, along the north-eastern boundary of that farm and the south-western boundary of No. 13; thence to the most westerly beacon of Etna Farm; thence along the south-western boundary of this farm to the Mombi River; thence due south to the Umsweswe River, up that river to the Mashaba Hills; thence southwards along that range to the Ngesi River, and up the Ngesi to the farm Christiana; thence along the southern boundaries of Christiana, Philipsdale, Albany, Umtegeza, Ngesi, Mexico, along the eastern boundaries of Mexico and Revelant and the northern boundary of Morrell to the boundary of the districts of Hartley and Marandellas, along this boundary to the Umfuli River, and down this river to the first-named point.

GATOOMA STATION.

An area in the native district of Hartley, bounded by a line drawn from the confluence of the Umfuli and Umnyiati Rivers, up the former to its junction with the Umshigarr River, up that river to its source, thence in a straight line to the most northern beacon of Railway Farm No. 12, along the north-eastern boundary of that farm and the south-western border of Farm No. 13; thence to the most westerly beacon of Etna Farm; thence along the south-western boundary of this farm to the Mombi River; thence due south to the Umsweswe River, and down that river and the Umnyiati to the first-named point.

UMSWESWE STATION.

An area in the native districts of Hartley and Charter, bounded by a line drawn from the junction of the Umnyiati and Umsweswe Rivers, up the former to the Mashaba Hills; thence southwards along that range to the Bumbi beacon thereon; thence in a straight line in a westerly direction to the beacon on Elephant Hill; thence in a straight line to mile 1,545 on the railway; thence in a straight line to the junction of the Umnyiati with the Sessombi River; thence down the Umnyiati River to the starting point.

BATTLEFIELDS STATION.

An area in the native districts of Hartley and Charter, bounded by a line drawn from the junction of the Sessombi and Umnyiati Rivers, up the latter to the Mashaba Hills; thence northwards along that range to the Bumbi beacon thereon; thence in a straight line in a westerly direction to the beacon on Elephant Hill; thence in a straight line to mile 1,545 on the railway; and thence to the point first named.

MAZOE.

An area including:

(a) The native district of Darwin.

(b) That portion of the native district of Mazoe north of a line drawn from the northernmost beacon on Moore's Grant to the north-east beacon; and thence to the south-east beacon of that estate; thence to the eastern beacon of the Howick Estate; thence to the eastern beacon and the southern beacon of Barley Bottom; and thence to the south-western beacon of Bedford Estate No. 2; thence following the western and southern boundary of the Bedford Estate to the westernmost beacon of Springvale; thence following the southern boundary of Springvale and Great B and the eastern boundary of the latter farm to the southernmost beacon of Arnold's; thence in a line eastwards to the western beacon of Pote, and thence along the northern boundary of that farm to the Poorti Rivier.

(c) That portion of the Goromonzi native district north of a line drawn from the north-west beacon of Bonny along the western boundaries of that farm and the Vale to the south-west beacon of the latter, and from that point along the northern boundary of the Msana Reserve to the Inyagui.

IRON MINE HILL STATION.

(a) The native districts of Victoria and Ndanga.

(b) That portion of the native district of Gutu lying to the south of the Divuli River, excluding the Eastdale Estate.

(c) That portion of the Chilimanzi district to the south of a line running along the north side of the Iron Mine Hill, Victoria Road, from the south-western boundary of the Central Estates to the Shasha River; thence up that river to the southern boundary of Endama Ranche; thence eastward along the southern boundaries of Endama Ranche, Felixburg and Grasslands; thence along the eastern boundary of Grasslands and the southern boundary of Eastdale Estate.

(d) The native district of Chibi, excluding that portion (1) lying to the south and west of the Nuanstisi River, and (2) that portion north-west of the old Tuli-Victoria Road.

(e) That part of the Selukwe native district east of a line drawn up the Tokwe River to the south boundary of the farm Finland; thence eastwards and northwards along the southern boundard of Finland and the eastern boundaries of the farm Mansfield.

(f) That portion of the Gwelo district comprising portion of the farms Upland and Iron Hill Mine and the farm Kleinfontein.

MOVEMENT OF TRANSPORT CATTLE.

NOTICE is hereby given that petitions have been received by His Honour the Administrator for permission to employ cattle for draught purposes in the under-mentioned areas. Any objections thereto must be lodged with the undersigned on or before the 24th March, 1911, and should contain particulars of the number and value of cattle on the farms represented by the objectors, together with any reasons for such objections.

HEADLANDS STATION.

An area bounded by a line drawn from the south-east corner of the Weya Reserve along the west boundary of the Inyata Block to the south-east beacon of Trelawney; thence along the south boundary of that farm; thence in a direct line to the north-east beacon of Nyamangura and along the east boundaries of that farm and Maringowe; thence in a direct line to the north-east beacon of Lone Kop; thence southwards and westwards along the boundaries so as to include the farms Lone Kop, Moodie's Vale, Emerald, Netzewa, Leeuwpoort, Lesbury, and the Willows; thence up the Machiki River to the southern boundary of Monte Cassino; thence along the south and east boundaries of that farm and from its most northern beacon in a direct line to the headwaters of the Umfuri River; thence down that river to the south-west beacon of the Weya Reserve, and along the south boundary of that Reserve to the point first named.

PASSAFORD STATION (proposed).

An area in the native district of Mazoe consisting of the farms Umsasa, Mbebi, Springvale, Passaford, Estes Park, Spa, Fairview, Weltevreden, and Mackay.

QUE QUE STATION.

An area in the native district of Gwelo, bounded by a line drawn from the north-east corner of Oryx, down to the Sebakwe and Umniati and Sanyati Rivers to the junction with the Zambesi; up that river to its junction with the Sengwe, and up that river to its junction with the Lutopi River; thence in a straight line to the junction of the Shangani and Gwelo Rivers, and up the latter to the north-east corner of the Main Belt Block; thence along the northern boundary of that block to the Que Que River, up that river to the most westerly corner of Watermael, along the northern and eastern boundaries of that farm and the eastern boundaries of Shawlands, Loads, Sunbury, Dwaalvlaakte, Wodehouse, Ermelo, Umsungwe Block to the most southern beacon of the Que Que Reserve; thence along the south-eastern boundary of Que Que Reserve to its most easterly beacon; thence along Ashdale boundary to the most westerly beacon of Rhodesdale; thence along the south-eastern boundaries of Ashdale, Bunsu, Shava, Oryx, to the starting point.

GWELO STATION.

An area in the native district of Gwelo bounded by a line drawn from a point on the Shangani River where it enters the Shangani Reserve; thence northwards along the boundary of that Reserve to the Gwelo River, and up that stream to the north-western corner of the Main Belt Block, along the northern boundary of that property to the Que Que River; thence up the Que Que River and the Long Valley Spruit to the northern boundary of the farm Long Valley; thence to the north-western beacon of that farm and

along its western boundary ; thence along the northern and eastern boundaries of Strathfillan, the southern boundaries of Adair and Wodehouse, the eastern and southern boundaries of Que Que Reserve and the eastern boundaries of Lochiel, Netherby, Stonefield, Kanuck, Ranjah's Ranche, Dopton, Wildebeeste Block, and Safago ; thence along the southern boundary of Safago and Divide, Kanuck, and south-eastern boundary of Watershed Block, and from the most southerly beacon of Watershed Block in a direct line to the south-eastern boundary of Somabula, along the southern boundary of Somabula, The Meadows, Good Hope, Johnston, and along the western boundary of Johnston, Vungwana South, Vungwana North and the south-western boundaries of Walton, Henley, Ensors, Desvages, the Vungu Block and Thompson's Farm ; thence along the north-western boundary of Thompson's Farm, north-westwards to the Vungu River ; thence down that river to its junction with the Shangani, and down that river to the starting point.

HUNTER ROAD SIDING.

An area in the native district of Gwelo bounded by a line drawn from the south-western beacon of Adair, along the western boundaries of that farm and Barkly and the southern boundary of Boschklouf, and along the western and northern boundaries of Long Valley to the Long Valley Spruit and down that stream to its confluence with the Que Que River ; thence up that river to the north-western corner of Watermael, along the northern and eastern boundaries of that farm and the eastern boundaries of Shawlands, Loads, Sunbury, Dwaalvlaakte and Wodehouse ; thence along the southern boundaries of Wodehouse and Adair to the first-named point.

MOVEMENT OF TRANSPORT CATTLE.

NOTICE is hereby given, that petitions have been received by His Honour the Administrator for permission to employ cattle for draught purposes in the undermentioned areas. Any objections thereto must be lodged with the undersigned on or before the 24th March, 1911, and should contain particulars of the number and value of cattle on the farms represented by the objectors, together with any reasons for such objections.

1,645½ mile peg, B. & M. & R. Railways.

An area in the district of Goromonzi, including the farms Warwickshire, Sublime, United, Stonehurst, Somerby, Spitzkop, Doornfontein, Sunnyside, Derry and Lilfordia.

ARCTURUS AREA.

An area in the native district of Goromonzi consisting of the following farms : The Crag, Kilmuir, The Meadows, Mount Shannon, Halstead, Bally Vaughan, Saratoga, Marsala, Frascati, Strathlorne, Ivordale, Devonina, Rudolphia, Thornvlei, Alderley, Learig, Gilnockie, Gardiner, Mabfen, Retreat, Guernsey, Grazely, Lonely Park, Chinyika, Orion, Reserve, Colga, Oribi, Ivanhoe.

ERIC A. NOBBS,

Director of Agriculture.

Department of Agriculture,
Salisbury, 16th March, 1911.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

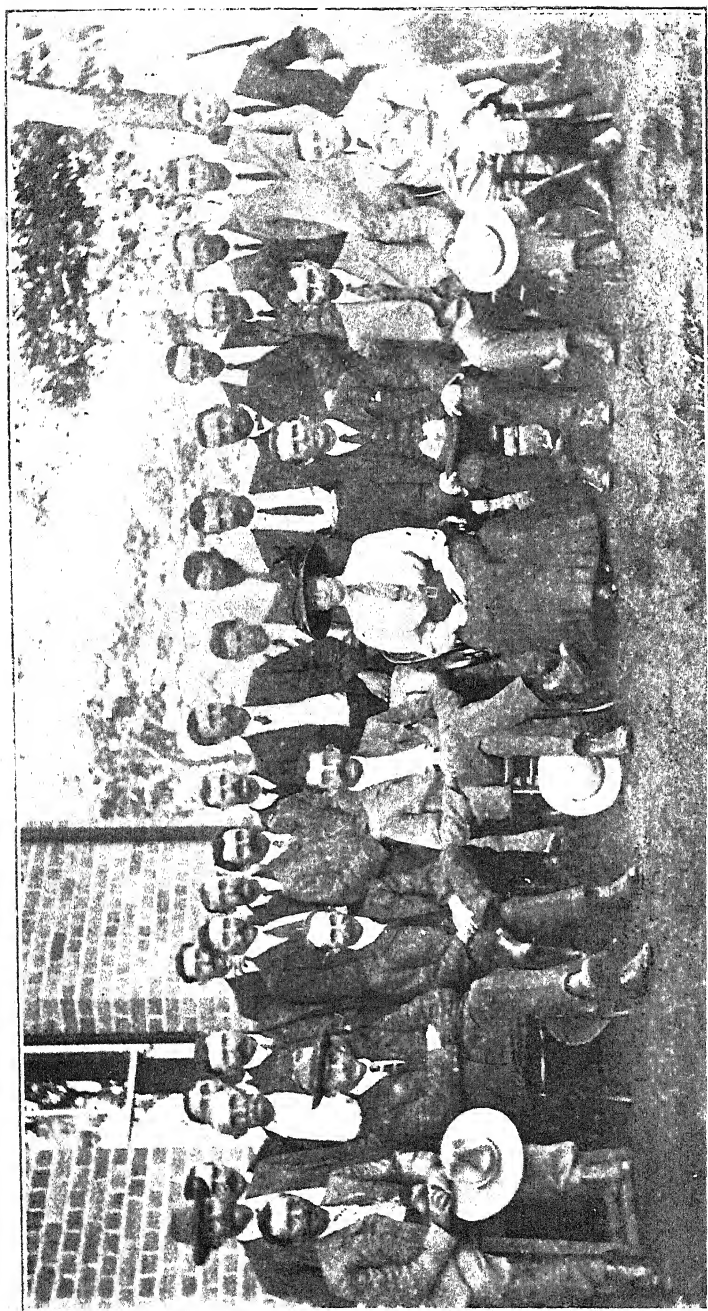
The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.



Members of the Mashonaland Farmers' Association, and others who visited the Botanical Experiment Station, and the Agricultural Laboratories, April 1911.



THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY

VOL. VIII.—NO. 5.] JUNE, 1911. [5s. per annum.

Editorial.

LEGISLATIVE COUNCIL.—One of the most important agricultural measures dealt with during the recent session was the discussion of the proposed Water Ordinance of 1911. This is an extremely important Act as affecting the farming community but has been withdrawn at the request of the elected members in order to afford them an opportunity of consulting their constituents. The measure is of considerable importance to farmers in this country, especially so to those who are irrigators or have possibilities for irrigation on their properties. The main features of the Ordinance consist of a definition of rights, and as none at present exist except arrangements which might hold good under Common Law, it seems a pity that the measure has to stand over. The Ordinance provides for the appointment of Water Courts consisting of not less than two or more than eight elected members and by the Magistrate or Native Commissioner having jurisdiction over the district.

Any person desiring to have his water rights determined, fixed and recorded, may apply to the Administrator under

the Act to have the matter submitted to and adjudicated upon, by a Water Court. Any right thus granted would become part and parcel of his title to the property and could not be taken away except under special circumstances and then, not without payment of compensation. Farmers with inner bank boundaries are placed in the same position as those whose boundaries are in the centre of the stream, and this should remove a great deal of anxiety in the minds of the former. Provision is made for the granting of loans for the construction of co-operative schemes, such loans to be redeemable over a period of years not exceeding 20 and bearing interest at the rate of 5 per centum per annum. To administer and manage such co-operative ventures, provision is made for the constitution of Irrigation Boards whose members will be elected by the proprietors interested. Many other desirable features will be found and it is to be hoped that the measure will become law without serious amendment at the next sitting of the Council.

AFRICAN COAST FEVER, BULAWAYO COMMONAGE.—It is with regret that we have to record a further outbreak of African Coast Fever on the Bulawayo Commonage, on which unfortunately there are a large number of cattle. The herd in which the disease was first located was immediately destroyed, but two other herds were subsequently found to be infected.

The Commonage is already fenced, and dividing fences are now in course of erection. Two extra dipping tanks are also being constructed as rapidly as possible, and it is sincerely hoped that by means of fencing off the areas, and by dipping regularly the disease will be confined to that portion of the Commonage on which it now exists.

THE DIRECTOR OF AGRICULTURE.—Owing to ill-health the Director of Agriculture has been ordered complete rest and quiet for six months. Dr. Nobbs left Salisbury on May 16th, and is first making a short voyage to Mauritius where if his health permits, he will spend a few days investigating the Mauritius hemp fibre industry. The plant of this name

grows readily in Rhodesia, and there seem good prospects of a profitable industry provided suitable machinery for decorating the fibre can be obtained.

THE CHIEF VETERINARY SURGEON has left on vacation leave, his place being taken by Mr. E. M. Jarvis, G.V.S., from Umtali. Mr. Jarvis has previously acted in a similar capacity, and has had a very extensive experience of African Coast Fever work.

EXPORT OF MAIZE.—The export of Rhodesian Maize has again been attended with gratifying results, both to the country as a whole and in particular to the Salisbury Farmers' Co-operative Society.

In spite of the fact that shipment was delayed dangerously late in the season—with the result that a large proportion of the grain had to be graded as "slightly weevily," the prices realised are extremely satisfactory. South African maize always realises a slightly enhanced price, owing to the fact that it is sun cured, as opposed to kiln-cured, and the Home market has shewn a decided appreciation of the quality of Rhodesian maize.

A total of approximately 47,000 bags of maize was exported to Europe, and the prices realised ranged from 22s. 6d. to 23s. 3d. per quarter, one parcel of 15,000 bags realising an average of 22s. 8½d. per quarter, while American maize was selling on the same date at 21s. per quarter, and flat white maize at 19s. 6d. per quarter on the Liverpool market on the same day.

EXPORT TO OTHER PARTS OF SOUTH AFRICA.—Owing to over-exportation from the Provinces of the Union, a shortage of maize occurred during March and April, and Rhodesia still having a surplus, was in a position to supply a further 20,000 bags of maize to other parts of South Africa. This season's crop throughout the Union Provinces is said to be very far below the average, and though the Rhodesian crop also is not likely to be as good as was at first hoped, a certain proportion of the anticipated surplus may probably again find a market in other parts of South Africa.

THE PIG RAISING INDUSTRY.—Arrangements have been made by the British South Africa Company for a short tour through Rhodesia by Mr. Loudon M. Douglas, the well known British expert on Swine Husbandry. Mr. Douglas is a recognised authority on all branches of pig raising and the utilization of pig products, and his assistance has been called in mainly with the object of bringing to a head, if possible, the long-discussed question of Bacon Factories in Rhodesia. There seems no reason to doubt that a Co-operative Bacon Factory would be a profitable undertaking provided the initial steps of organisation and equipment are thoroughly sound, and in this respect Mr. Douglas' wide experience will be of great value.

Hitherto the pig breeder has waited on the formation of a factory and the factory has not come because the supply of pigs could not be guaranteed. This state of affairs might go on indefinitely, but it is to be hoped that Mr. Douglas' visit, during July and August, will bring matters to a satisfactory head.

In this connection it is proposed that Mr. Douglas should visit certain of the main centres where he will have an opportunity of meeting the farmers interested and discussing the question with them. Secretaries of local Farmers' Associations whose members are desirous of profiting by Mr. Douglas' lectures are requested to communicate promptly with the Director of Agriculture, and, as far as possible, Mr. Douglas' tour will be planned accordingly.

GRASS BURNING.—Attention is drawn to an article on grass burning by a farming correspondent whose warning is most timely, since the season of grass fires will shortly be upon us. The injury caused by grass fires is more serious in some districts than others, but never a season passes without reports of serious losses from this cause, and too great caution cannot be exercised. As Mr. Waddel points out, the person who burns the grass on his own farm without first guarding against its spread to adjoining properties, is guilty of criminal negligence. It is a simple matter to form fire belts, either with the mower or by breaking down the grass with a sledge or felled tree drawn by oxen, and the comparative security from fire is ample recompense for the labour.

RAILWAY RATES ON OIL SEEDS, ETC.—In view of the possibility of finding a profitable outlet for any surplus supplies of ground-nuts or linseed the Railway Company have kindly supplied a list of freight charges on these commodities from various parts of Rhodesia to consuming centres in the Southern Provinces.

One of the hindrances to the importation of labour saving machinery for the ground-nut crop has been the question whether the local demand might not be over supplied. There seems small prospect of this and in any case almost unlimited supplies will find a market in Johannesburg and Durban while the oil mills of London and Marseilles always remain to fall back upon.

The table of freights here referred to will enable farmers to judge whether they cannot largely increase their acreage of ground-nuts and linseed with a view to catering both for the Rhodesian and South African markets.

WEATHER CONDITIONS.—Very unusual for the time of year, and in many cases with disastrous results to farmers, heavy and continuous rain fell almost throughout the Territory during the second week in May. At the time of writing it is difficult to estimate the extent of the damage, but though in certain cases late crops may have benefitted, the general results have been harmful rather than beneficial.

Tobacco growers have probably been the worst sufferers, particularly those who, without flue barns, were relying on suncuring their leaf. Early maize and main crop potatoes have also suffered, and many tons of veld grass hay and forage must have been injured or lost. On the other hand the rains have caused a light regrowth of bottom grass which in some cases will be helpful, and the conditions generally were favourable for winter-sown wheat and forage. It is stated that similar weather at this time has not occurred for at least ten years.

The total rainfall has again been somewhat unevenly distributed, but most districts show a return somewhat in excess of the annual average.

AGRICULTURAL SHOWS.—By the time this appears in print the first show of the season will have been held at Bulawayo, May 25th and 26th. We would take this opportunity of congratulating the Bulawayo Agricultural Society on their decision to hold a show in spite of the necessary absence of cattle from the show yard and the difficulties caused by the stoppage of oxtransport. Though the show cannot fail to lose some of its attractiveness on this account, it is certain that the public will patronise it none the less if only on account of the sporting spirit which the Society have shown.

This year the Salisbury show takes the form of a Horse Show, which is advertised for the 8th and 9th of June, and which is followed on the 15th and 16th of the month by the Umtali Agricultural Show.

IMPORTATION OF PEDIGREE STOCK.—Preparations are now in hand for the reception of the pedigree Shorthorn, Hereford and Sussex bulls which are expected to arrive about the end of the month. The animals have been very carefully selected, and it is hoped in the next issue of the JOURNAL to reproduce photographs of the actual animals on their arrival. The terms under which the bulls are offered to the farming public are extremely favourable, and a considerable number of applications have already been received. Further reference to this matter will be found under the heading of Departmental Notices.

Attention is also directed to the table of charges appearing in this issue and showing the cost of importing various classes of farm stock from the Cape Colony to different centres in Rhodesia.

The Detection and Prevention of the Diseases of Stock in Rhodesia.

(Continued).

By L. E. W. BEVAN, M.R.C.V.S.

THE NOSTRILS should be examined, and the colour of the mucous membrane lining the nasal passage should be compared with that of the eye and mouth. In glanders of the horse the colour of the septum, or division between the two sides of the nose, may be of a characteristic grey, and nodules or ulcers may be found upon it.

Discharges may be noticed from one or both sides of the nose. The discharge in the case of glanders is of a starchy character at first, later it becomes opaque and blood-stained, as might be expected from the diseased state of the septum. Strangles, Rinderpest, Nasal Gleet, Catarrh, or common cold, are some of the many conditions which are accompanied by discharges from the nose. In the last stages of the lung form of Horse-sickness a characteristic straw-coloured fluid may pour down the nose or be whipped up into a foam.

It is a common thing in this country to see sheep with a thick mucous discharge around the nostrils, generally due to a catarrh brought about by crowding together large numbers of animals at night in badly ventilated huts, and frequently caused by the presence of the larvæ of the *œstrus ovis* which invades the nostrils and air spaces of the head.

In equines the wings of the nose are brought into play in forced respiration when the animal is struggling for breath.

In cattle it is a sign of health for the muzzle to be moistened with small drops like dew. When the animal is fevered the nose becomes dry and almost cracked. In dogs fever is sometimes detected by the heat of the nose.

THE MOUTH is next examined. Attention is first paid to the teeth from which an estimate is made as to the age of the animal, a matter of considerable importance in diagnosis. Irregularities in dentition may perhaps be noticed, affording an explanation for a lack of condition which might otherwise be attributed to other causes.

The colour of the mucous membranes should be compared with that of other membranes, and the odour of the breath should be noted.

One or two infective diseases are characterised by special lesions in the mouth. Thus, in Rinderpest the oral mucous membrane presents a bright salmon colour, and sometimes a bran-like eruption on the palate is discovered and multiple ulcers are seen on the lips and dental pad; the breath may have a foetid odour.

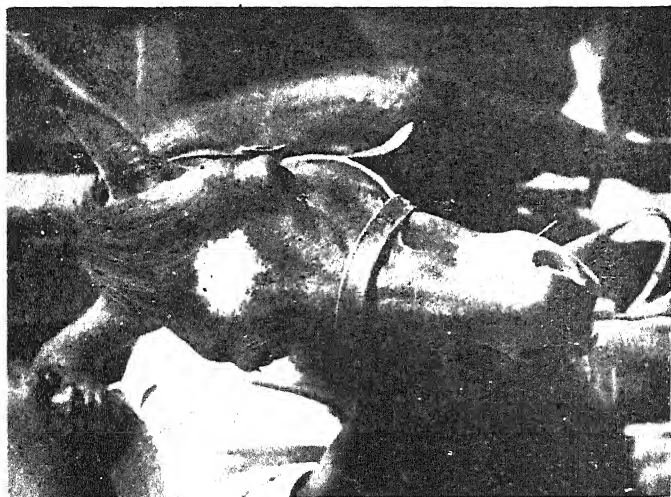
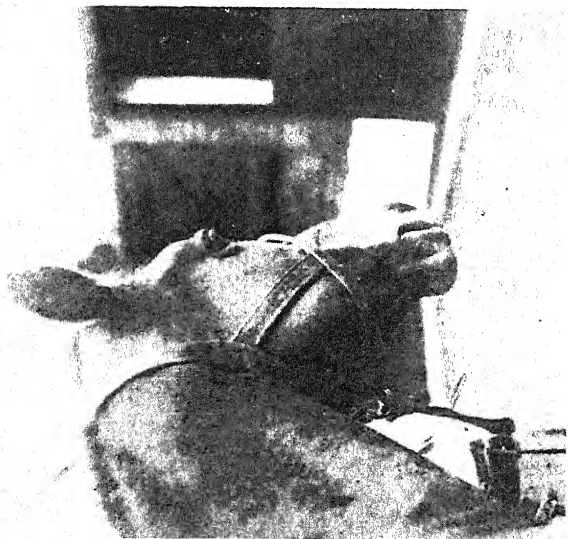
A loss of power in the jaw is a characteristic feature of the last stages of Rabies. The animal loses its power of prehension, is unable to swallow and a thick saliva may hang in ropes from the corners of its lips. The un-knowing are liable to attribute this condition to a foreign body in the throat, but it is best not to test the truth of the suspicion by making a close examination, as the saliva of such an animal contains the deadly virus of the disease. Malarial catarrh or "blue tongue" of sheep is frequently manifested by a characteristic condition of the lips and tongue, frequently accompanied by an inflammatory condition above the feet.

THE PULSE should now be felt; in the horse the pulse is felt where the artery passes from between the jaws immediately over the bone and beneath the skin to reach the face. The position is shown in the accompanying photograph.

In the cow it may be felt in front of the large muscle of the cheek or more easily on the under surface of the tail. In the sheep, pig and dog it is felt for inside the forearm or thigh. From the pulse may be determined the condition of the heart and vessels.

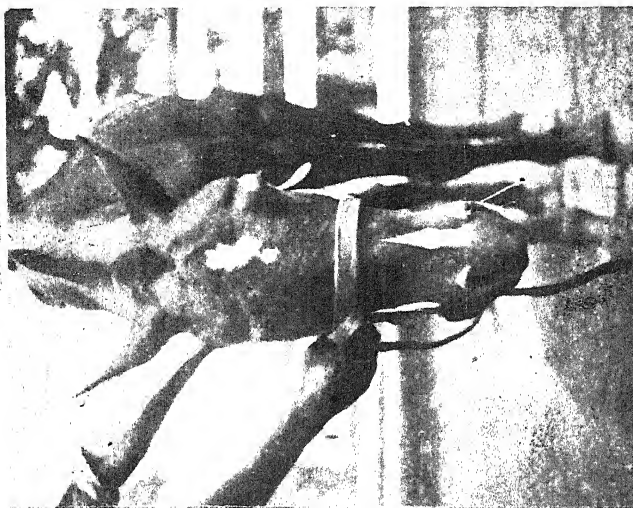
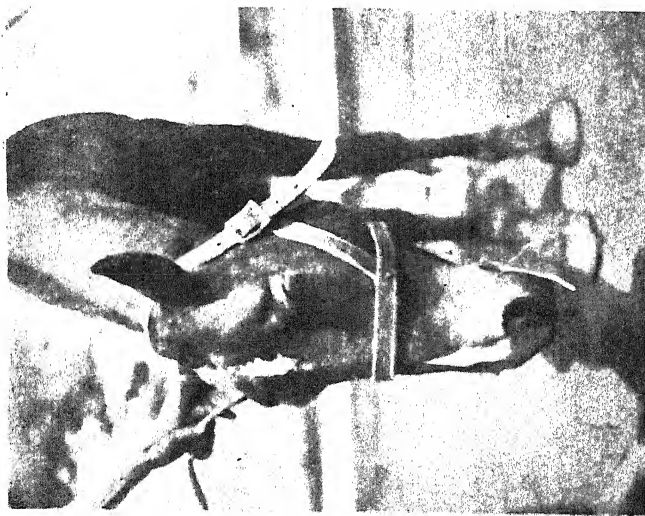
It is necessary when feeling a pulse to note the following points:—

- a. Its frequency; that is the number of pulse beats per minute. This gives the rate of the heart beats. The



Horse Sickness: Horse "Saba" suffering from "dik-kop."

[Referred to on p. 596 R.A.J., Vol. VIII., No. 4, 1911.]



Horse Sickness : Horse "Don Q" suffering from "dik-kap."

[Referred to on p. 593/4, R.A.J., Vol. VIII., No. 4, 1911.

following are the pulse beats of the more common farm animals :—

The horse	...	...	38 to 43 per minute.
The cow	...	...	50 to 60 „
The sheep	...	...	75 to 80 „
The dog	...	...	80 to 90 „

But it must be remembered that these numbers vary in perfectly normal circumstances, thus, the usual rate per minute of the pulse of heavy cart-horses is about 35, of well bred horses about 40, and of small ponies about 45. The younger the animal the quicker the pulse.

- b.* Its length ; that is how long a time each pulse-beat occupies.
- c.* Its strength ; whether it is a strong bounding pulse or a feeble beat ; this indicates the force with which the heart is beating.
- d.* Its regularity or irregularity ; irregularity may occur owing to irregular cardiac action either in pace or in rhythm.
- e.* Its tension ; that is the force necessary to obliterate it. This gives an indication of the state of the arterial walls and the peripheral resistance.

The interpretation of the pulse requires a knowledge of the physiology of the circulation, and the subject is only dealt with briefly as it is perhaps somewhat too complicated for laymen.

Between the branches of the lower jaw are the SUB-MAXILLIARY GLANDS. These may become enlarged in strangles and in glanders. In the former an abscess may form and rupture. In glanders the tumour appears to be adherent to the bone. In the "dik-kop" form of horse-sickness the tissues between the jaw become infiltrated and swollen with fluid. Similarly in some diseases of sheep (fluke, wire worm) and cattle (plasmoses) where anæmia and dropsy are the principal lesions, the fluids accumulating in this position give rise to the condition known as "bottle jaw."

THE NECK. Leaving the head one reaches the neck, and here the depression known as the jugular furrow should be observed. It may sometimes be noticed that, with the heart beat, the vein shews a damming back or regurgitation of blood from the heart. This is known as 'jugular pulse,' and indicates an over burdened heart or actual heart disease.

THE CONDITION OF THE SKIN AND COAT, OR FLEECE. should next be examined. It should be noted whether it is soft and supple, whether it moves easily on the ribs, or whether it is dry and scurfy and invaded by parasites.

The healthy ox will frequently lick itself, turning up the hair on its flanks and ribs; the absence of these so-called "lick marks" is one of the symptoms of ill health.

Mange, scab and ringworm are parasitic diseases which should be detected and rigorously dealt with, not only from a curative but from a preventive point of view.

In Rhodesia so many animal diseases are transmitted by TICKS that it behoves every stock-owner to wage war upon the pests.

The reader is recommended to carefully peruse the valuable contribution on "The Relationship of Ticks and Animal Diseases," by Mr. Rupert Jack, F.E.S., Government Entomologist, appearing in the August number of this JOURNAL, 1910, and republished in Bulletin form, and also an article on "The Construction of Dipping Tanks for Cattle," to be found in the same issue.

It may be well, here, to briefly recapitulate the tick-borne diseases, and the species of ticks which take part in their transmission.

TICK.

DISEASE.	COMMON NAME.	SCIENTIFIC NAME.
East Coast Fever	The Brown tick	<i>Rhipicephalus appendiculatus</i>
	The Black-pitted tick	<i>R. simus</i>
	The Red-legged tick	<i>R. evertsi</i>
	The Cape Brown tick	<i>R. capensis</i>
	The Shiny Brown tick	<i>R. nitens</i>
Redwater	The Blue tick	<i>Margaropus decoloratus</i>

Biliary Fever of Equines	The Red-legged tick	<i>R. evertsi</i>
Biliary Fever of Dogs	The Dog tick	<i>Haemaphysalis leachi</i>
Spirochaetosis of Fowls	The Fowl tick	<i>Argas persicus</i>
Heartwater	The Bont tick	<i>Amblyomma hebraeum</i>
Foot rot of sheep	The Bont-legged tick	<i>Hyalomma aegyptium</i>
Abscesses and sloughs in dogs and other animals		

It must be remembered that the damage caused by ticks is not limited to the fully inflated female ticks which are most easily seen, but that in many diseases the intermediate stages of the tick which are less noticeable because more minute, are equally dangerous.

The fully engorged healthy female tick is capable of laying many thousands of eggs, each of which may hatch into a larva. But it has been found that when such mother ticks have been collected from an animal which has been immersed in a suitable dip, although they may live for some days yet they lay no eggs, or deposit eggs which do not hatch. This is one of the greatest factors in the cleansing of a farm of ticks.

The life history of a tick is as follows:—The egg hatches into a larva, which feeds and moults and becomes a nymph; this again feeds and moults and emerges as the adult capable of reproduction.

Some species can complete their life cycle upon one animal, as, for example, the Blue Tick; others pass two stages upon the one animal, dropping off to attach themselves in a later stage, *e.g.*, the Red-legged tick; others, as for example, the Brown tick, drop off when engorged at each stage of the cycle.

Consequently the period during which the ticks are attached to their hosts vary considerably, but in some cases, notably the larval and nymphal stages of the Brown tick, the time may be as short as five days. If, therefore, it is desired to make sure that no Brown ticks which may have engorged

upon an animal suffering from East Coast Fever shall drop off and escape between the dippings, to transmit the disease to a susceptible animal to which it attaches in a later stage, it becomes necessary to dip every five days. This sounds excessive, but it is largely practised in Natal, and Dr. Theiler, in the *Transvaal Agricultural Journal*, Vol. IX., October 1901, No. 33, lays emphasis on the point, recommending for the purpose a dip prepared by Mr. Watkins Pitchford, and composed as follows:—

Soft Soap	...	...	...	5½ lbs.
Paraffin	...	...	...	2 gallons.
Arsenite of Soda	...	...	...	8½ lbs.
Water	...	...	...	400 gallons.

In preparing this dip at this Laboratory it has been found advisable to dissolve the soap and arsenic in sufficient boiling water, and then to remove the mixture from the fire and stir in the paraffin. This concentrated solution is then added and thoroughly mixed with the bulk of water.

Objection will no doubt be raised on the grounds of the trouble in preparing this dip and the time spent in dipping so often. Perhaps the method is rather extreme except when African Coast Fever has to be rigourously dealt with. Many of the owners of cattle on Salisbury Commonage have voluntarily and safely passed their cattle once a week through the Government Tank, where the solution is prepared of a strength for ten-day dipping.

Animals frequently dipped learn to hold up their heads when plunging and swimming through the tank; this should be prevented, as many ticks favour the inside of the ears.

Systematic dipping is also necessary in dealing with scab, mange and other parasitic diseases, because the dressings, or dips, which kill the parasite may have no effect on the eggs from which further broods of acari will hatch out. It has been shown that "the destruction of the insects hatched after the first dipping, before they commence egg-laying, is perfectly certain, at an interval of 14 to 18 days, while it is much the best for the wool, the hair, and the animals, and far less trying for them."

Some skin lesions, which are peculiar to specific diseases will be dealt with later.

THE RESPIRATION should be closely studied. This process consists of two acts:—

- a. Inspiration, whereby air is taken into the lungs for the aëration of the blood which is only separated from it by the thin walls of the vessels of the lungs and air-sacs.
- b. Expiration, or the expulsion of the air which has lost its oxygen in the blood and gained a considerable amount of carbonic acid, and perhaps some other gases from the blood.

The number of respirations per minute in perfectly normal circumstances average as follows:—

Horse	...	...	...	8 to 10	per minute
Ox	...	...	...	12	15 „
Sheep and Goat	...	...	...	12	20 „
Dog	...	...	...	15	20 „

As a rule, the larger the animal the slower the respirations. Rumination, muscular exertion, excitement or nervousness may increase the average.

When, owing to pain or obstruction in the chest, the ribs are fixed as much as possible, the abdominal muscles are brought into play to an abnormal extent, causing what is known as *abdominal breathing*. On the other hand, when there is pain or pressure in the abdomen, preventing the abdominal muscles from participating to their natural extent, *thoracic breathing* results.

It should be remembered that difficult breathing may result from :

- a. Some mechanical obstruction to the entrance of air into the lungs.
- b. Circumstances which interfere with respiratory movements, such as pain, exudates into the lungs or chest cavity, pressure from the abdominal cavity, etc.
- c. A depraved condition of the blood.

When studying the respiration care should be taken to note whether the animal coughs and if so an endeavour should be made to determine the cause.

(To be continued).

The Possibilities of an Export Trade in Oil Seeds.

By H. GODFREY MUNDY, F.L.S., etc.,
Government Agriculturist and Botanist.

Several enquiries have recently reached this office regarding the possibilities of finding a market for Rhodesian grown linseed and ground nuts. Little need be said regarding the latter crop. During the past season local supplies have been totally inadequate to meet local demand, and large quantities of nuts have been imported from Portuguese Territory to make good a shortage of a crop which grows in Rhodesia as readily as anywhere one can name. There must of course be some reason for this anomaly, and it exists in the fact that the crop is a somewhat expensive one to handle, particularly when labour is scarce. The majority of farmers only grow a small acreage for this reason, but labour-saving machinery is now obtainable for handling the crop from the time of planting until it is bagged and ready for sale.

The complete plant is comparatively costly, and before investing money the grower naturally wishes to be assured of a ready market for all that he can produce. The question of growing ground-nuts has already been dealt with in this journal (December, 1909), but recently enquiries have been made as to what markets exist in other parts of South Africa supposing over-production should occur in Rhodesia.

The New Transvaal Chemical Company, with headquarters at Delmore, near Johannesburg, have authorised the writer to state that they are prepared to take almost unlimited quantities of nuts at 8s. per 100 lbs., for undecorticated or unshelled nuts, and 11s. 6d. per 100 lbs. for shelled nuts, both prices f.o.r. Delmore. The company is further prepared to supply bags f.o.r. Delmore, without charge to the grower returns his crop in them; and is also anxious to enter into contracts with growers and thus to guarantee a definite market.

Similarly, Messrs. Lever Bros., Ltd., of Durban, state that they would be willing to consider the purchase of ground-nuts on the basis of £12 per long ton (2,240 lbs.) delivered Durban for decorticated or shelled nuts. Small parcels, however, are of no interest to this firm, and a minimum of 50 ton lots is suggested.

From the above statements it is evident that a large demand for ground-nuts exists both in Johannesburg and Durban, the firms above mentioned utilise the ground-nut for oil production, but in addition to this large supplies are imported into the Transvaal for use on the mines, while a certain amount is used in confectionery work.

When well cured and provided they are unshelled, ground-nuts can be stored safely for long periods. The crop is not one which must necessarily be harvested or marketed rapidly and, unlike maize, the nuts do not suffer from weevil. The value of the crop, taken weight for weight, is approximately double that of maize, and it would appear well that farmers should give this matter some little thought and consideration in order to decide whether with profit to themselves they could not largely increase the annual production of ground-nuts.

SOYA BEANS.

During the last few months a good deal of interest has centred around what to European farmers is, comparatively speaking, a new oil-producing crop, namely Soya beans. We learn from Natal that, in experiments carried out there, the best average crop runs about six bags (200 lbs.) of beans per acre. Several varieties have been under trial on the Botanical Experimental Station, Salisbury, during the last two seasons, and, while some have failed entirely, others have done moderately well, and better results may be expected next season from acclimatised and selected seed.

At present, however, all varieties show one serious fault, namely, uneven ripening, which naturally entails a considerable loss of seed. It is as yet too early to make any definite statement regarding the general suitability of the crop to Southern Rhodesia. As a rotation crop for home feeding on the farm, those varieties which do well, may probably have considerable value, but the present market value as an oil seed would not appear to hold out great inducement to Rhodesian farmers.

Messrs. Lever Bros., of Durban, in answer to a request, have kindly favoured us with the following advice, which will be of interest to those who are already growing or intend to grow this crop:—

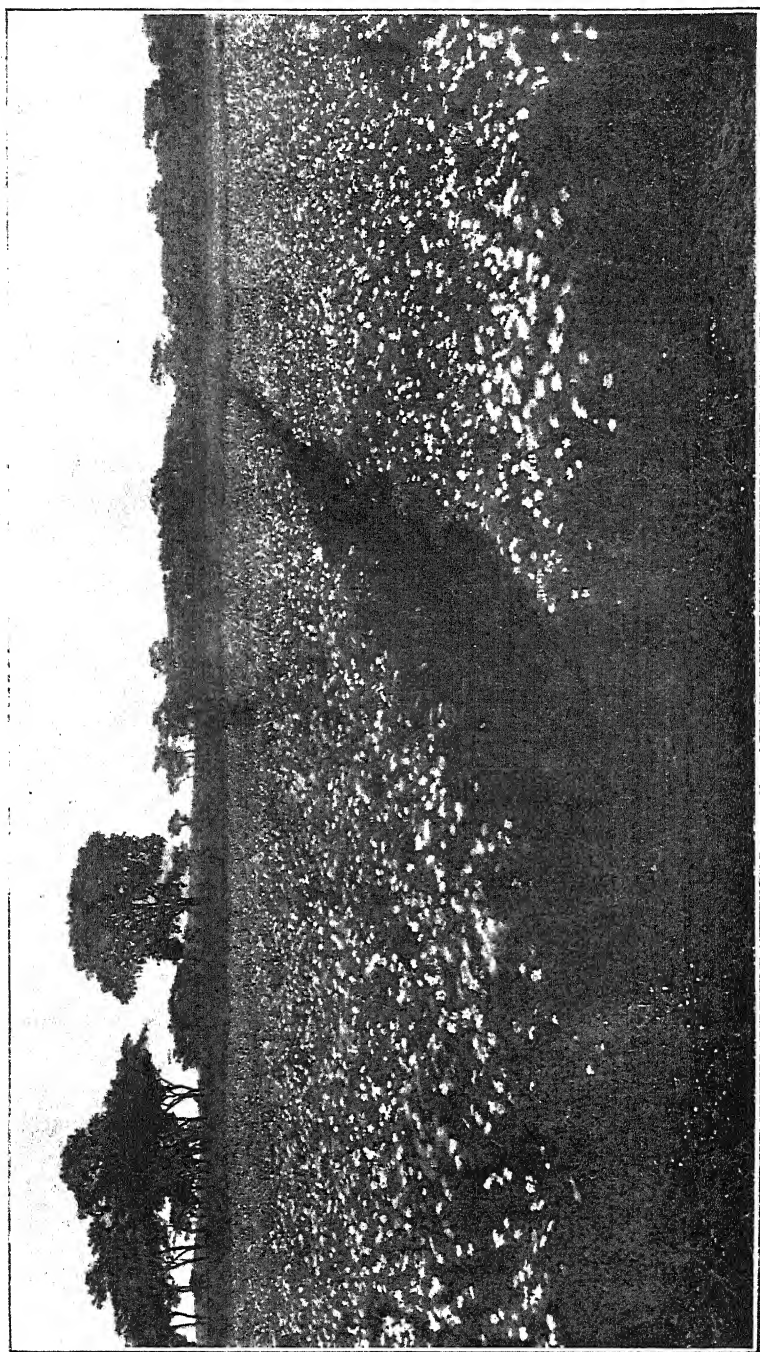
“At the present time we could give for soya beans delivered Durban 10/3d. per bag of 200 lbs., to be packed in bags of 2½ lbs. weight; to be shelled suitably dried and in merchantable condition.” (Dated March 29th, 1911.)

LINSEED OR FLAX.

(*Linum usitatissimum*.)

The growing of linseed is rapidly gaining ground in Rhodesia, a sure indication that as a crop it thrives well. As a matter of fact it thrives exceedingly well, and on suitable land appears almost as certain a crop as any that is grown. Thus far linseed has not passed the “small patch” stage, the reason being that the grain meets with but small local demand, that which is sold usually being purchased for seed purposes. Many stock farmers, particularly those interested in dairying, grow a small acreage for home feeding, but a few bags of uncrushed seed go a long way, and as yet the majority of farmers have no facilities for crushing—a far more economical form in which to feed the seed.

Some months back it was thought advisable to forward a sample of Rhodesian grown linseed to England for examination and technical report. The sample was despatched to Messrs. Allan Bros. & Co., Dundee, by whom the following report was kindly furnished:—“We are glad to be able to say that we think that the sample a splendid one and almost equal to the finest Indian linseed. Prices have been very high for the last six months, in fact if Rhodesian farmers could sell now and if they had large quantities to offer a small fortune might be made. Linseed just now (March, 1911) is about 70s. per quarter of 416 lbs., but for Argentine linseed arriving shortly, prices are about 60s. 6d. per quarter, and Calcutta seed to arrive in May and June was done yesterday at 68s. 6d. per 410 lbs. in bags c.i.p., London, less 2½ per cent. Linseed Association terms. By the time Rhodesian linseed arrives on the market, prices may of course be up or down from those we have named approximately. Two years ago linseed was about 45s. per quarter, so you will see how extreme fluctuations in the value of this oil seed can be. Can you



Linsced, variety trials. Botanical Experiment Station, Salisbury.



Reaping Pskoff Linseed.

give us any idea of the quantity of this Rhodesian seed there is likely to be on offer, and to what port it could be brought—say Glasgow, Leith or Hull. We should be glad to give you an offer for a few hundred quarters. (The weight of a quarter varies from 410 lbs. to 424 lbs.)”

Messrs. William Knox and Co., of Aberdeen, also report on a sample as follows:—“The quality is A1, and would rank high with crushers. The to-day value is about 70s. per quarter of 424 lbs. in double bags, nett weight; bags free, sound delivered Aberdeen. Aberdeen Dock Company’s weights. Payment on arrival linseed, less $2\frac{1}{2}$ per cent. discount, and also 1 per cent. commission.

Linseed is sold on a basis of 96 per cent. purity—sellers allowing for any excess of admixture. Business is done on the Linseed Contract form No. 3 of 1907.

The above information is without engagement, and merely to post you as to the customs of the linseed trade.”

The sample of linseed under review was of normal quality, grown on the Botanical Experimental Station, Salisbury, 1909-10, and was six months old when forwarded for examination. The seed was locally grown the previous year, and proves to be of the same kind as that known by the trade as Argentine linseed. The objection to this kind is that it ripens unevenly, and thereby entails a good deal of shedding of ripe seed. This season five varieties have been under trial, and three have been found which ripen entirely evenly. The comparative yield of seed per acre of these have not yet been obtained, but the earliest strain of all—Pskoff linseed—gave a crop of 620 lbs. clean seed per acre. This would be equivalent to $1\frac{1}{2}$ quarters per acre, and valued at an intermediate price of 55s. per quarter, would be worth approximately £4 2s. 6d. per acre f.o.b. Aberdeen, or at the present price of 70s. per quarter, approximately £5 5s. per acre.

The crop of 620 lbs. of seed per acre was grown on second year land, the first year’s crop having been maize. The previous season an excellent crop was grown on new land. From the above figures it would appear that there may be a profitable export trade in linseed and we are further informed by Messrs. Lever Bros. of Durban. that they anticipate shortly erecting a plant suitable for extracting oil from linseed which

would mean a considerable demand for this seed in South Africa.

To those who have not already experience in growing the crop, the following notes will be of interest:—

The weight per bushel of good linseed varies from 52 to 56 lbs. Good seed should give a purity test of 98 per cent. and a germination test of 85 per cent. Riga seed grown one year in Holland is usually regarded as the best seed procurable.

The most suitable soil for the crop is a fresh, deep, well-tilled, and not too heavy loam—but any soil that will produce an average crop of maize is suitable. It has been found in flax growing countries that a succession of crops is impossible with this plant. The results are a poor yield, and often a disease, flax-wilt, is brought on by these methods, in which case no crop at all is obtained.

Flax is generally recommended as a crop that does best on newly broken land. The best crops are obtained by fallowing the land, by early ploughing; then at the sowing season giving a deep cross ploughing and harrowing, and finally rolling. This being so, the value of the crop is somewhat enhanced under our conditions—some of the newly broken lands might be sown with it the first year, and so instead of a poor crop of maize, a good crop of linseed might be obtained.

The quantity of seed to sow per acre is about 20 to 25 lbs. The seed is usually drilled in rows about 8 inches apart, but if the land is free from weeds it may be sown broadcast. Generally the former method is preferable, as in this case weeding is rendered easy. Being a comparatively quick growing crop, however, it is possible to defer sowing until December, and meantime to thoroughly clean the land by good cultivation.

The best time for sowing appears to be after the maize crop is in, but much depends on the season. The crop takes from 90 to 120 days to mature. Careful and regular observation is required towards the ripening time of the seed. If the crop becomes too ripe it shells badly, and this may be the cause of serious loss. To determine the exact season at which to harvest the seed crop, the surest method is to cut one of the seed capsules transversely, and if the seed is set and past the

soft milky stage the crop is fit for harvest. Cutting with a reaper or reaper and binder is the easiest method of harvesting.

At present most of the crops are cut by hand, as shown in the illustration, and in any case after cutting the straw should be tied in bundles and stocked in the fields for two or three weeks until quite ripe and mature. When dry the capsules or seed heads break open easily and the crop can then be threshed with any threshing machine suitable for small grains, or the seed can be beaten out by hand or in the old primitive method trodden out on a threshing floor by cattle. Winnowing is the next process necessary, and when this is accomplished the seed can be bagged and is ready for market.

A sown muid sack will hold about 200 lbs. of linseed, but owing to the small size of the grain it is always advisable to use double bags, and for export this is particularly desirable. Linseed straw and linseed husks are of good feeding value, and are usually eaten greedily by farm stock.

Diseases.—Linseed is subject to two important diseases: (1) Flax wilt, already referred to; (2) Flax dodder. The former is somewhat similar to "clover sickness," that is the land becomes flax sick and a disease known as "wilt" makes its appearance. This disease is particularly noticeable when linseed is grown on the same land for two or more years in succession, and for this reason linseed should always take its place in a rotation, and should not appear on the same ground two years running. Prevention is better than cure, and if this practice is followed the disease is not usually serious. Flax wilt takes the form of a damping off of the young plant just above the surface of the ground. The stems lose their rigidity, topple over, and, if the infection is serious, the whole stand may soon lie flat upon the ground, with the result, of course, that the plants succumb. There is no treatment, and when bad infection has occurred the land should not be used again for linseed for a period of five to seven years.

FLAX DODDER (*Cuscuta Epilinum Weihe*) is very similar to lucerne or clover dodder, and an illustration of this disease is shown on the accompanying plate. The disease is parasitic,

and the parasite plant may make its appearance at any stage of the host plants' existence. Except for a very short time after germination the plant has no connection with the soil. The seedling is thread-like in appearance and whitish in colour, without any leaves. Unless it comes in contact with a linseed plant on which it can establish itself it quickly dies. On coming in contact with a linseed plant the thread-like seedling winds round its stem, and at certain points of contact sends out roots or suckers which draw nourishment from the host plant. The thin stems resemble a mass of reddish yellow hair, and rapidly spread from one plant to another, so that a small local infection soon becomes a large patch.

TREATMENT.—The plant is an annual and reproduces itself by seed. Infection is usually caused by a few dodder seeds being present in the linseed. When a crop is found to be attacked by dodder the host plants should be at once pulled up and left on the ground to dry. They can then be sprinkled with paraffin, and the whole covered with dry grass and brush wood and burnt. This is the only effective method of eradication—always burn *in situ*; never attempt to carry infected plants off the land, otherwise seed and bits of stem will be dropped which may cause a re-infection. Destroy, if possible, immediately the plant is located, and do not permit it to seed. Avoid the risk of using seed from an infected crop, as it is always possible that small patches of dodder have been overlooked. The treatment of linseed dodder is practically the same as for lucerne or clover dodder.

With these exceptions linseed is comparatively free from insect or fungoid disease, and as far as present experience in Rhodesia extends it appears a crop which can be relied upon with great certainty.



Linseed Dodder (Cuscuta Epilinum Weike).

B. & M. & R.R.
RATES, LINSEED, GROUND-NUTS.

Station From	Station To	Lots 15 tons and over Mixed or otherwise	Lots 5 tons and over, but under 15 tons Mixed or otherwise	Lots 1 ton and over, under 5 tons Mixed or otherwise	REMARKS
		Linseed and Ground-nuts	Linseed and Ground-nuts	Linseed and Ground-nuts	
		per ton	per ton	per ton	
Umtali	Delmore	£2 12 0 ³ / ₄	£3 14 1 ¹ / ₂	£7 15 11	Loaded by senders Offloaded by railways but Cartage at Delmore not included
Headlands	"	2 10 4	3 10 8	6 10 3	
Salisbury	"	2 8 6 ¹ / ₄	3 7 0 ¹ / ₂	6 0 11	
Eldorado	"	2 10 2	3 10 4	7 7 7	
Gwelo	"	2 4 7 ¹ / ₄	2 19 2 ¹ / ₂	4 6 9	
Bulawayo	"	2 2 3	2 14 6	3 17 4	
Plumtree	"	2 0 10 ¹ / ₂	2 11 9	3 11 10	
Salisbury	Jo'burg	2 11 0 ¹ / ₄	3 9 6 ¹ / ₂	6 3 5	Loaded by senders, off-loaded by railways, and including cartage
"	Durban	3 11 0 ¹ / ₄	4 9 6 ¹ / ₂	7 3 5	
"	Beira	0 12 3 ¹ / ₂	3 6 10	4 2 10	Loaded by senders, but including Pierage at Beira

Difficult Parturition in the Cow.

By C. R. EDMONDS, M.R.C.V.S., G.V.S.

Probably owing to the conditions under which cattle are kept in Rhodesia difficulties in parturition are comparatively rare, at the same time cases do occur.

Difficulty may arise from various causes, such as abnormal formation of the parturient passages, malformation of the calf, diseases, etc., but by far the commoner cause of difficulty, and the only one that I propose to deal with, is unnatural presentation of the calf. Before doing so, however, it may be advisable to consider:—

SIGNS OF PREGNANCY.—Cows become quieter and more inclined to rest, shew improvement in condition, the abdomen enlarges and becomes more pendulous; going off milk; movements of calf often noticed after the mother takes a drink; these are some of the outward signs, but if absolute diagnosis is required, the surest way is to examine the cow per rectum, that is, either oil the arm or soap it well; pass the hand through the anus, and, after having removed the dung from the back passage, feel with the hand by pressing the bowel down gently, and, when the cow is three or four months in calf, the form of the calf can be easily felt. There is very little danger of causing abortion by such examination if it is gently and quietly done. Of course the cow should be in the standing position.

SIGNS OF PARTURITION.—Enlargement of the udder. This may occur several days before the act of calving takes place, and in very heavy milkers it is sometimes advisable and necessary to milk the cow before the calf is born. In other cases not much enlargement takes place until immediately before calving; in heifers the udder often enlarges and subsides again once or twice before the true enlargement, prior to calving occurs.

A discharge of stringy sticky mucous from the passage, which soils the tail and the hocks occurs, a desire to get away from the rest of the herd, the abdomen becomes more pendant, the flanks and croup look hollow, the ligaments on each side of the roots of the tail become relaxed and appear quite soft when pressed by the points of the fingers; the animal is unwilling to walk, and when it does it walks with a stilty staggering gait in the hind limbs. As parturition draws nearer the cow becomes restless, lies down and gets up again. It will often be noticed at this stage that the cow pricks her ears up and listens in quite a marked manner (to hear the calf bellow). The labour pains will soon commence, the water bag will be first expelled and soon after that the calf; if everything is normal.

We have now arrive at the stage in which the majority of men find their cows, that is, either with a calf born and everything alright or else the cow is in difficulty. My reason for saying this is, that it is not the custom to stay with the cow all the time when she is expected to calve, but to look at her at shorter or longer intervals, and it is the exception in such cases to come just at the time that a cow is in normal parturition. Anyway we will take it that the owner has arrived on the scene and that the animal is:—

IN LABOUR.—If he is early, perhaps the water bag only may be showing and the parturition may be a normal one, time will prove—be patient. Watch and wait. If it is, the water bag will rupture as it should do; if the watcher sees this is the case, and the animal is making little or no progress, it may be advisable to tear a hole in the bag with the fingers, and allow some of the contents to escape. As parturition progresses, if the calf is coming in a normal manner, no assistance whatever may be required. In other cases, if the calf is a big one for instance, it may be advisable to help the mother by giving a pull when the shoulders and hips are coming through the passage. I would impress upon my readers to be very patient with heifers with their first calf, give them plenty of time, and a little assistance if required; it may take a heifer a few hours to deliver her first calf, but this is preferable to the owner just drawing it out by brute strength in a few minutes.

On the other hand, the owner may arrive on the scene when the stage of parturition is further advanced. The experienced man will be able to tell so to speak at a glance, if everything is correct or not, but the inexperienced may have some difficulty in doing so, therefore I will first briefly touch upon the normal presentations of the calf. It is normal for a calf to be born tail first as well as head first; I make this statement because I have been told wonderful tales by people who have wasted their strength and energy in turning a calf that was presented tail first, inside its mother's womb, to get it to be born head first.

ANTERIOR OR HEAD-FIRST PRESENTATION.—By far the commonest form of presentation and by some recognised as the only natural form, is, for the calf to come with its front legs resting on the floor of the passage with its head resting on top of its legs, the nose being above and slightly in front of the knees. The calf's belly is of course towards its mother's udder, and the top of its head and back are towards its mother's spine. This presentation may be varied by the calf coming so to speak upside down, that is, on its back, with its belly towards its mother's spine, or it may be coming either on its left or its right side, but these latter positions are rare.

POSTERIOR OR TAIL PRESENTATION.—The normal or natural position for a calf to be in this presentation, is for the hind legs to rest on the floor of the passage, and the back of the calf to be towards the mother's spine. I have often thought that calves are easier to deliver this way than head first, and of course this presentation may be varied by the calf being on its back, or side, as explained in the anterior presentation.

ABNORMAL PRESENTATION.—The positions that are recorded are very numerous indeed, as one can easily imagine if one considers what a loose jointed and flexible animal the calf is at birth. Fortunately the average farmer is not likely to meet with many of them in the course of his career, the commoner ones, are for one or both front legs to be doubled back at the knees, or the head only presented with both front legs away back or both front legs in the passage, with the head away back on the ribs, or down between the front

legs. But to hark back and commence at the beginning we will take it the owner has arrived on the scene and found a cow in :—

DIFFICULT LABOUR—due to some abnormal position of the calf. What will he want; and what is he to do to relieve the cow and get the calf into the world? In the first place he should have 3 or 4 ropes about six feet long, and as thick as a man's little finger, with an eye *spliced* in one end, in preference to an eye made by tying a knot, as a knot takes up room, etc. Failing ropes, have reims, but reims get very slimy and slippery if the job is a long one. Next a bucket containing warm water in which a disinfectant has been placed, then either a bottle of carbolised oil, or similar preparation, or a cake of soap that will lather well for the purpose of greasing the operator's arm, also two or more (if possible) assistants.

If he is wise, he will have on an old pair of trousers, and if he means business, he will next strip naked to the waist, and prepare himself for a dirty, and perhaps difficult job. Cleanliness counts for a lot in this sort of work—the operator's hands and arms should be first washed in the disinfectant solution in the bucket in which his ropes are soaking; then oiled or soaped, and his examination of his patient commences.

EXAMINATION.—Probably there will be some part or parts of the calf visible to the eye, such as a foot, but whether there is or not, the first rule to observe is to *take nothing for granted*. If a foot is seen do not conclude it is a front foot until the hand has been passed up the leg and has found a knee, and not a hock. If two feet are seen do not conclude they are both fore or both hind, until they have found to be so by examination, and even if two front or two hind limbs are located in the passage, do not conclude that they must belong to one calf, until this has been made certain by passing the hand up the one limb, then across the body, and down the other limb.

The object the operator has in view, is to get the calf into one of the two normal positions already mentioned, in order that it may be born either head first, or tail first, and naturally he will choose whichever one is the easier, from the position

that the calf is presented to him in. It is impossible in an article of this description, to state what should be done in every case, the operator must use his own common sense. I can only give him a few general rules to follow.

On first putting his hand into the passage, he will find whether the cow is "roomy" or not, whether the calf is big or small, judging from the joints, how long the cow has been in labour by the parts being moist, and about blood heat or dry; or dry and hot, or if an offensive odour is present shewing that decomposition has set in, and by this means he will be able to estimate his chances of success. He will next ascertain the position the calf is presented in, and at the same time will have made up his mind as to the way he is going to attempt delivery. A good rule to be followed at this stage is to put a rope on any part of the calf that is presented; the way to do this, is, thread the end of the rope through the eye and so form a running noose, place this noose over the three centre fingers of either hand, so that one rope comes on the inside of the little finger, and the other on the inside of the thumb. The eye with the rope threaded through it will be somewhere near the root of the thumb according to the size of loop made. To secure a limb, place this running noose over the foot and up just above the fetlock joint, then loop the rope over the pastern joint just above the hoof. That limb is then secure; to secure the head make a larger running noose than is required for a limb, place the rope in the same position in the hand, pass the noose at the back of both the calf's ears, and work the eye with the rope threaded through it into the calf's mouth.

Having secured by ropes the parts presented, the next matter is to get into position for a normal presentation any parts that are not presented. To get a limb into position, the method is, to find the foot. Place this in the palm of the hand to prevent it rupturing or injuring the womb, and by bending the leg at the knee, or hock joint, so bring the foot into the passage. To do this, it may be necessary to push the calf back a bit into the womb, but as the operator has already placed ropes on the parts that he could get at, he will be able to find them again when he has got the limb into position. To get the head into position, the operator must try and prevent injury to the womb by the teeth in the lower

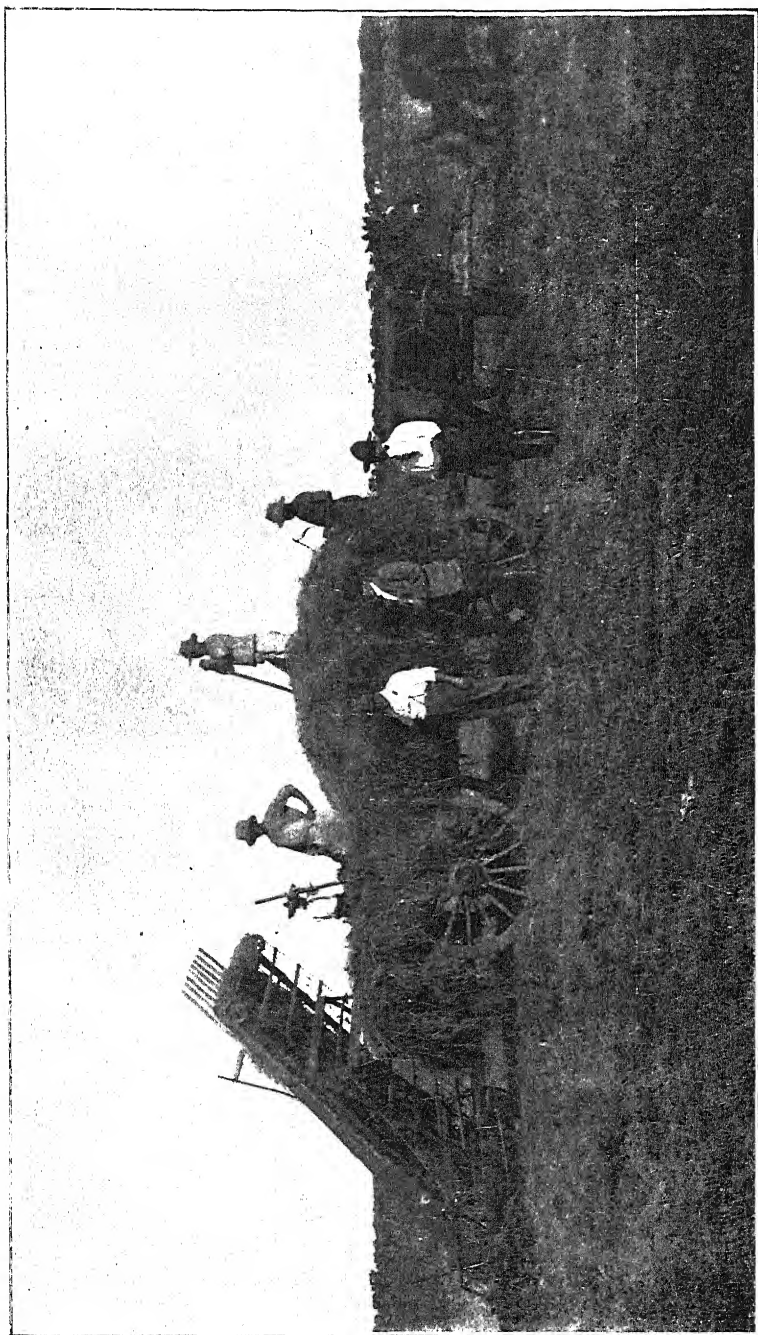
jaw, for if the mouth gets opened this is liable to occur; having got the calf into position, the next thing to be done is to get the calf out, and the amount of assistance or traction that will be required will depend on circumstances, such as size of calf; room in parturient passages; length of time cow has been in labour, etc. The operator's duty is to see that every thing is in proper position, and then direct his assistant when to pull the ropes. (a) They should only pull when the cow has her *pains*, that is when she is attempting to expell her calf, and should rest when the cow rests. (b) To see that no greater traction is exerted on one limb than the other; less traction is required on the head than on the front legs. (c) The assistants should not pull quite in a direct line with the cow's body, but slightly at a downward angle towards the cow's hocks. If the calf is being delivered tail first, the operator should have his hand in the passage and pull on the tail.

When the calf is delivered with great trouble, in all probability it will appear as if dead, but it is surprising how life can be put into apparently lifeless calves by perserverance. My plan has always been with every calf, no matter how dead it may appear to be (of course unless it is stone cold or stinking), to open its mouth, wiping the mucous from the nostrils and mouth at the same time, then blow into the mouth. Next administer two or three hard smacks with the open hand upon the ribs over the heart. If these methods do not bring any appearance of returning life raise the calf by placing one hand on either side of the body and swing the head with a swaying motion of the whole body of the calf for a minute or two, then another smack or two if necessary and another swing, and if there is any life in the calf it should be evident by this time.

During the time the operator is working with the cow, the animal will perhaps be standing at the commencement but will soon lie down and then perhaps get up again. The operator must keep working away whatever position the cow may assume, the only thing he can do is perhaps turn her over from one side to the other to make it easier for him to work at a particular limb of the calf.

Different owners; different ways. Some men never allow the cow to see the calf once it is born, but if the cow has had

a very rough time of it, and there is a doubt as to her recovery, I believe in leaving the calf with her to lick and take a maternal interest in. Sometimes a cow will have nothing to do with the calf. A little common salt sprinkled on the calf may induce her to do so, and at the same time the salt will do the mother good; If this will not answer, setting a small terrier on to yap round the calf may answer. On the other hand some mothers take a very lively interest in their offspring—on more than one occasion the writer has seen a cowhouse cleared of mankind in record time by a fond mother—we live and learn, and as I have had experience of the latter type on one or two occasions, nowadays, I am very suspicious of excited looking animals, especially heifers, and tie them up before commencing operations.



A mechanical Hay Loader, recently working on the Salisbury Commonage.

Use of Maize as Forage.

By R. H. B. DICKSON, Government Agriculturist.

In unfavourable seasons and on new ground, the maize crop is sometimes so poor that it is barely worth harvesting for the grain, and the grower then wishes to utilise it to the best advantage for forage. The term Maize Fodder is applied to the entire plant when used for forage, either green or dried, on which the ears or cobs are allowed to remain. Stover refers to the dry stalks and leaves after the ears have been removed.

Although the crop is often planted for the express purpose of obtaining fodder, in which case the grower expects to secure a large amount of forage carrying small ears—the conversion into fodder of a poor crop, sown for grain, is probably the best way of utilizing a partial failure. Although maize fodder lacks the succulence of silage, in the absence of the silo it is the next most economical way of utilizing this valuable crop. In feeding it is found to be nearly equal to Timothy hay. While 1 to 2 tons of hay per acre is a good yield, 3 to 4 tons of maize fodder can reasonably be expected, and shows the economy of the latter food-stuff.

PLANTING.—Maize intended for fodder should be planted thicker than when the object is to secure grain only, as thicker planting gives a larger yield of stover and grain, but the crop will then contain a larger proportion of small ears, and will be of a poorer quality. As in the case of maize grown for grain production, the thickness of planting depends upon the fertility of the soil, the amount of the rainfall, the length of the growing season, and the capacity of the soil to retain moisture.

TIME OF CUTTING.—Maize may be cut later for fodder than for silage, as for the latter, succulence is of importance.

For fodder the crop may stand until the husks begin to turn white, and the bottom two or three leaves of the stalk turn brown. At this stage the plant will have reached that period of maturity when it has stored up a large amount of dry matter and still produces fodder of good quality, not too coarse and pithy. As maturity advances maize increases very rapidly in content of dry matter, and great loss results from a too early cutting of a crop intended for fodder.

The grain should be left to the well-dented and glazed stage when grown for fodder. The quality of the grain must be sacrificed to some extent for the better quality of stover produced. Not only is there an increase in total dry matter as maturity advances, but the amount of digestible material increases also. The following table, the result of work carried out at the Geneva Experimental Station, New York State, U.S.A., is of interest :—

AMOUNT OF DRY MATTER AND WATER IN MAIZE.

Stage of Growth.		Weight of fodder per acre. Tons.	Water per acre. Tons.	Dry matter per acre. Tons.
Fully tasseled	...	9'0	8'2	0'8
Fully silked	...	12'8	11'3	1'5
Kernels watery to full				
milk	...	16'3	14'0	2'3
Kernels glazing	...	16'1	12'5	3'6
Ripe	...	14'2	10'2	4'0

From glazing to full ripening, the increase in dry matter was 716lbs. per acre. Owing to the large production of sugar in the late stages of growth, one pound of dry substance of a mature well-eared maize plant possesses a higher nutritive value than at any earlier stage of growth.

METHOD OF HARVESTING.—The crop may be cut by hand with sickles, and tied into bundles which are shocked erectly. The shocks should be fairly large, so that two boys can reach round them; large shocks save time in shocking, and there is less surface exposed to the weather, and consequently less waste. There will be sufficient aeration in large shocks to prevent heating if not bound too tightly and if set up erect. Serious damage by rain need not be taken into account in

Southern Rhodesia, unless sufficient fodder is cut to last well into the summer ; damp and insufficient aeration are the chief causes of mould. The fodder is generally left in the field and fed as required, or it may be shredded, baled and put into barns, but this adds materially to the expense. It is not advisable to stack maize fodder, as this means handling the crop twice, involving extra labour and loss of leaves.

YIELD PER ACRE.—Three to four tons per acre is a good yield of maize fodder, of which about half the weight would be grain. The thicker the planting, the greater the yield, and the higher the proportion of stover to grain. At the Illinois Experimental Station, 59 bushels of grain were obtained from maize planted three inches apart, of which 46 bushels were of poor quality, while when planted twelve inches apart, 73 bushels out of 89 bushels reaped were of good quality. These yields were obtained in the great maize belt of the United States. Of the nutriment in maize fodder, about one-half is derived from the ears.

LOSSES IN FODDER.—The loss in fodder through exposure to weather is probably very slight in Southern Rhodesia, except where late rains occur. Rain on stored hay or fodder produces fermentation, and the more valuable constituents are washed out. The great value of maize fodder, however, is the very low cost of production compared with that of any other bulky feeding stuffs of similar feeding value.

Grass Burning.

By J. WADDEL.

While grass burning is commonly regarded as an evil by the farming community, a section of the public have reasons for thinking otherwise. The man who desires early grass, the prospector who finds long grass a hindrance to the exercise of his calling, and also hunters, both black and white, have undeniable motives. Perhaps the most powerful reason of all is to be found in the fact that the presence of dry grass constitutes a danger to buildings, crops, stock and other property, the owners of which never feel at ease while so much inflammable material is at hand. Instead of waiting till accident or wantonness creates the blaze the parties interested usually prefer to choose their own time and apply the match when most convenient and safe to themselves.

It must be admitted those reasons are at least plausible, in fact are convincing enough to account for nearly all the grass in the country being burnt off every season. But something more than a mere reason is required before property belonging to other people can be destroyed. There must be an arrangement between the parties. The man who burns his own and his neighbour's house may have his reason, but if it fails to satisfy the other party on whom the loss falls, it will avail him nothing. The weak point of all arrangements in favour of grass burning is that the person who does the firing is invariably unwilling to accept the consequences.

The ancient problem expressed in the words "shall not a man do what he will with his own," has a direct bearing on grass burning. The owner of grass is certainly at liberty to burn or otherwise destroy it if he wishes, but if through doing so loss or even danger accrues to others his act becomes either criminal or foolish according to its results. The person who in firing his own grass sends a sheet of flame

over the boundary on to his neighbour's property somewhat resembles that individual, half fool, half criminal, who shoots another not knowing the gun to be loaded. The difference between the cases is, that in the latter a searching enquiry is made into the circumstances, and a certain opprobrium attaches to the guilty or careless person, while in the other case the culprit remains carefully and securely in the background.

Authorities are unanimously of opinion that grass burning is injurious to the soil. Some go so far as to say that the practice robs the land of its fertility, and the inference is that if grass burning be persisted in barrenness will eventually result.

There may be some truth in these statements but the evidence of experience does not necessarily bear them out. In spite of grass having been annually burnt off for at least many generations, it still springs up luxuriantly, and the satisfactory crops produced on arable land give ample testimony to the fertility of the soil. If exhaustion takes place through this cause the process is so exceedingly slow that it is scarcely worth considering, but there is still a serious indictment against grass burning with regard to the soil. Though it may not produce exhaustion, it certainly prevents the increase of fertility.

The benefits that accrue from the presence of vegetable matter in a soil is nowhere more apparent than in Rhodesia. Black soil, so much prized in maize growing, derives its qualities from its organic contents. Wet vleis, often masses of peaty matter almost purely vegetable, produce enormous crops, and seem of inexhaustable fertility. These classes of soil are often shallow, usually overlining red soil. The deposits of vegetable matter would never have occurred had not the presence of moisture retarded the fire and allowed dead vegetable matter to accumulate.

On granite formation the effect of vegetable matter in the soil is very striking. Vlei land being capable of producing good crops while the land immediately surrounding it may be nearly barren. Sandy plains produce a thin wiry grass, and the degree of fertility possessed by the soil may be gauged by the nature of the herbage—whenever a better

quality of grass is met with it will be found that something has occurred to favour the formation of vegetable deposit in that particular part.

It may not be idle to speculate for a moment on what the condition of the country would have been to-day if fires had never swept over it. The old meadows of England would not have been richer, and its grassy stretches and its forest land would have been covered by a deep and fertile mould. Sandy land as we know it would have been changed by the yearly contributions into a loam easily worked and suitable for all sorts of crops. Earthworms would very probably have been present. Unfortunately fires have frustrated the beneficent work of nature, and through this cause a magnificent heritage has been lost. Though late, it is certainly our duty to conserve and build up the natural fertility of the country, and a readier means of doing this does not exist than abolishing the starting of grass fires, the spread of which soon becomes quite beyond the control of human agency.

An additional argument against the practice that should carry some weight is that it is against the law. That consideration, however, is not sufficient. The general public, who have nothing to lose by grass fires, regard the offence as venial. A conviction, except with proved malicious intent, would not damage the reputation of anyone. It is exceedingly improbable that the example of other countries where persons caught in the act have been promptly shot will be followed here, but as population becomes denser friction of a very acute character is bound to arise between the owners of grass and the burners of it. Perhaps the only real remedy, and preferable to any number of pains and penalties, is to awaken the public conscience to the fact that indiscriminate grass burning is a crime against the country and against all those interested in land in Rhodesia.

Standing grass on a farm should be regarded as less sacred than the haystack or the thatch of the farm-house roof. Grass fires can only originate through accident or design, and where the cause has not been accidental it must have been of malice, and where such fire endangers the grass on adjoining properties the act becomes criminal in the extreme.

Composition of Cows' Milk.

By G. N. BLACKSHAW, B.Sc., F.C.S., Government Agricultural Chemist.

With the object of fixing a standard of quality to which genuine cows' milk should conform, the English Board of Agriculture, in the year 1900, appointed a Departmental Committee to collect evidence regarding the composition of milk, and after exhaustive enquiries, the following standard was adopted:—"11.5% Total Solids, of which not less than 3% must be fat; milk offered for sale found to be under this standard to be considered adulterated, unless the contrary can be proved."

The proviso was added for the reason that the milk of individual cows, and even the mixed milk of a number of cows, is liable to contain less than the regulation 3% fat. That the milk of individual cows frequently contains less than the standard percentage of fat has been proved time and again, but by way of illustration, the results obtained by the writer when testing the quality of milk yielded by individual cows of the Friesland, Shorthorn and Jersey breeds, at the Elsenburg College, Cape Province, in 1906-7, may be cited:—

TABLE I.

Breed.	Times of Milking	Number of Tests made.		Number of times Milk below 3%	
		morn.	even.	morn.	even.
Friesland ...	6-30 a.m.	68.	67.	51.	8.
Jersey ...	and	82.	77.	20.	0.
Shorthorn ...	4-30 p.m.	56.	50.	45.	9.

Although not occurring so frequently, it is possible for the *mixed milk* of a herd (the morning milk more particularly), to contain less than 3% fat, a fact which was proved in 1903 by an investigation made into the quality of the mixed milk of the Garforth herd of dairy Shorthorns, owned by the Agricultural Department of the University of Leeds. The results obtained with this herd were as follows:—

TABLE II.

Mean Results for a period of 52 days.

MORNING.				EVENING.			
Time of Milking.	Total Milk Yield, lbs.	Fat %	Solids, not fat, %	Time of Milking.	Total Milk Yield, lbs.	Fat %	Solids, not fat, %
6 a.m.	219.4	2.88	8.81	3.30 p.m.	183.4	4.18	8.67

The English standard of purity for milk has for many years been used in the Cape Province, and justifiably so, as will be seen from the following summary results of a large number of tests, made in the Government Laboratories in the Cape.

TABLE III.

Western Province Milk (average for three years, 1907-9).

Number of Samples Analysed.	Fat %	Solids, not fat, %
2,401	3.79	8.70

Eastern Province Milk (average of 7½ years).

Number of Samples Analysed.	Fat %	Solids, not fat, %
437.	4.37	8.97

The chief causes of variability in the fat content of milk, may be classified under the following heads:—

- (a) Breed.
- (b) Period of lactation, or length of the time since last calving.
- (c) Intervals between milkings.
- (d) Feeding.

(a) BREED.—That the fat content of milk is subject to considerable variation according to the breed of the cow, will readily be seen from the following figures, drawn from tests made at the Elsenburg College during January and February, 1911.

TABLE IV.

Average percentages of Butter-fat of the breeds of cattle at Elsenburg.

Breed.			January.	February.
Frieslands	...	...	3.05	3.1
Jerseys	...	...	4.83	4.9
Ayrshires...	...	...	3.90	4.3
Shorthorns	...	...	3.90	3.9

An investigation into the quality of the milk yielded by two classes of native cows—the German East African and Victoria type of Mashona—has also been conducted in the Agricultural Laboratory, Salisbury, and, as is to be expected with animals unaccustomed to being handled, much variation was found in the quality of the milk from day to day, but in view of the large number of samples examined, the liability to error on this account has doubtless been reduced to a minimum.

In the following table is given the average content of fat in samples of milk drawn from three German East African cows and one Victorian cow, the number of samples tested being, in the case of the former 429, and the latter 116.

TABLE V.

Fat content of milk yielded by native cows of the German East African and Victoria type of Mashona breeds.

	German E. Africa	Victoria.
1st four weeks after calving	4'91 %	4'58 %
2nd " " " "	5'00 "	4'94 "
3rd " " " "	4'65 "	5'35 "
4th " " " "	4'99 "	5'10 "
5th " " " "	5'89 "	5'58 "
6th " " " "	5'32 "	...
7th " " " "	6'25 "	6'78 "
8th " " " "	7'61 "	7'26 "

These figures, which constitute the first evidence recorded, regarding the percentage amount of fat in the milk of two of our native breeds, clearly support the reputation of native cows for giving milk of rich quality.

(b) Variation in the fat content of milk during the lactation period:—After the first few weeks there is a gradual increase in the percentage of butter-fat, as the lactation period advances, although this is not always uniform, as will be seen on reference to Table V.

(c) Effect of intervals between the milkings upon the quality of milk:—The fat content of milk is very materially influenced by the length of time intervening between the milkings. As a general rule, the morning milk, whilst larger in quantity, is poorer in quality, than that of the evening; the difference not being so marked, however, when the intervals between the milkings are equal. The difference in the amount of fat present in the morning and evening milk will be noted from the following results obtained by the writer when testing the milk of the Elsenburg herd (1906-7). The cows were milked twice daily—6.30 a.m. and 4.30 p.m.—the intervals between the milkings being 14 hours and 10 hours respectively.

TABLE VI.

Breed.	Number of Cows used for test.	Percentage amount of fat Average for 5 weeks.		Average differ- ence in the per- centage amount of fat morning and evening.
		Morning Milk.	Evening Milk.	
Friesland ...	4	2.5	3.5	1.00
Jersey ...	5	3.7	6.05	2.35
Shorthorn ...	2	2.47	3.79	1.32
Ayrshire ...	2	3.19	4.82	1.63
Cape ...	2	2.88	3.77	0.89

(d) EFFECT OF FEEDING UPON QUALITY OF MILK.—Opinions differ considerably on this matter, but the general conclusion to be drawn from many carefully conducted trials, is that a change of food, in the case of well nourished cows, has a temporary effect only upon the fat content, the milk returning to its normal quality as soon as the animal has become accustomed to its new diet. It is only in cases where a cow has been improperly fed, and as a result, been reduced to low condition, that a change to a properly balanced ration will permanently improve the quality of the milk.

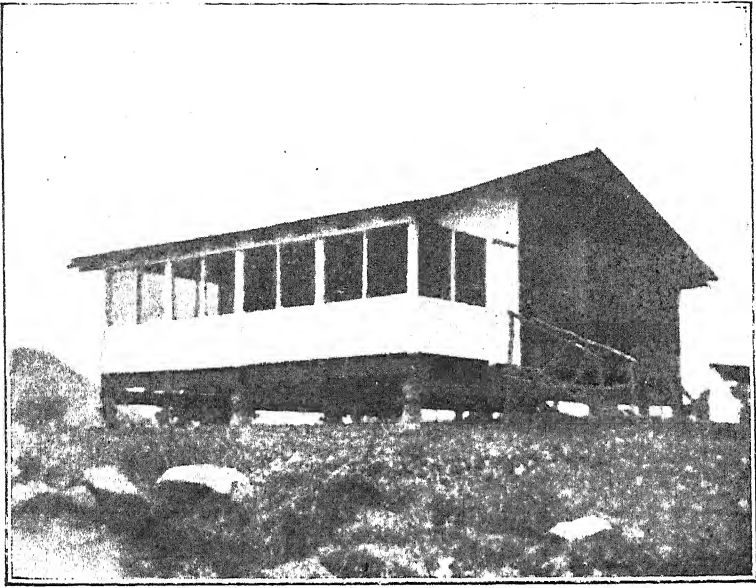
Practical Hints on Farm Hygiene.

By OSWALD BAKER, M.D.

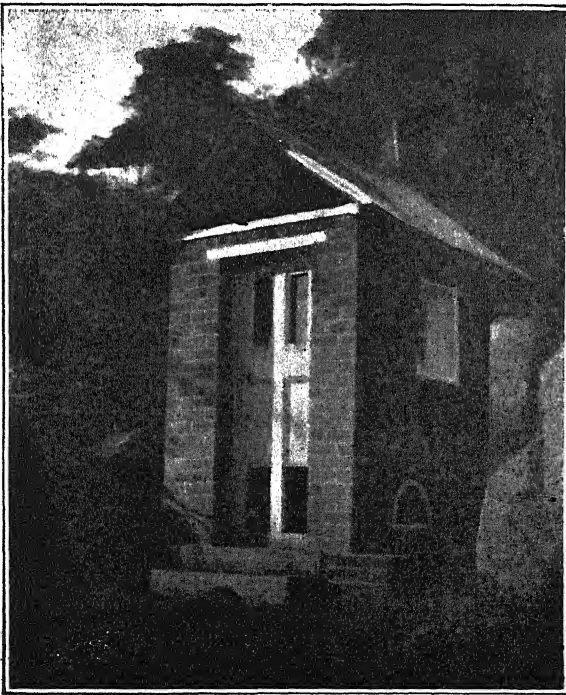
STOEPS OR VERANDAHS.—Many of the stoeps seen in this country would be far more useful and comfortable if, instead of being quite open and exposed, they were built up all round to a height of some four feet above the floor or ground. A verandah that is open from top to bottom is a delightful place to sit in during the day in fine weather, and also on a warm evening, provided it is entirely enclosed with wire-woven gauze for the exclusion of mosquitoes and other insects. But in cold weather such is far from being the case, while in wet weather a stoep which is completely exposed is usually untenable.

With an enclosing wall of brick or wood some four feet high an altogether different state of matters obtains. The stoep or verandah then becomes habitable in any weather, and, except at times when rain is driven by the wind, is, as well as being the healthiest, generally the most comfortable portion of the house. It is in fact converted into a room such as the rooms now invariably found in sanatoria, and which, indeed, constitute the chief feature of these admirable institutions for the treatment of consumptives. All verandahs in India, where people have had considerable experience in the art of living comfortably under trying climatic conditions, are constructed on this principle.

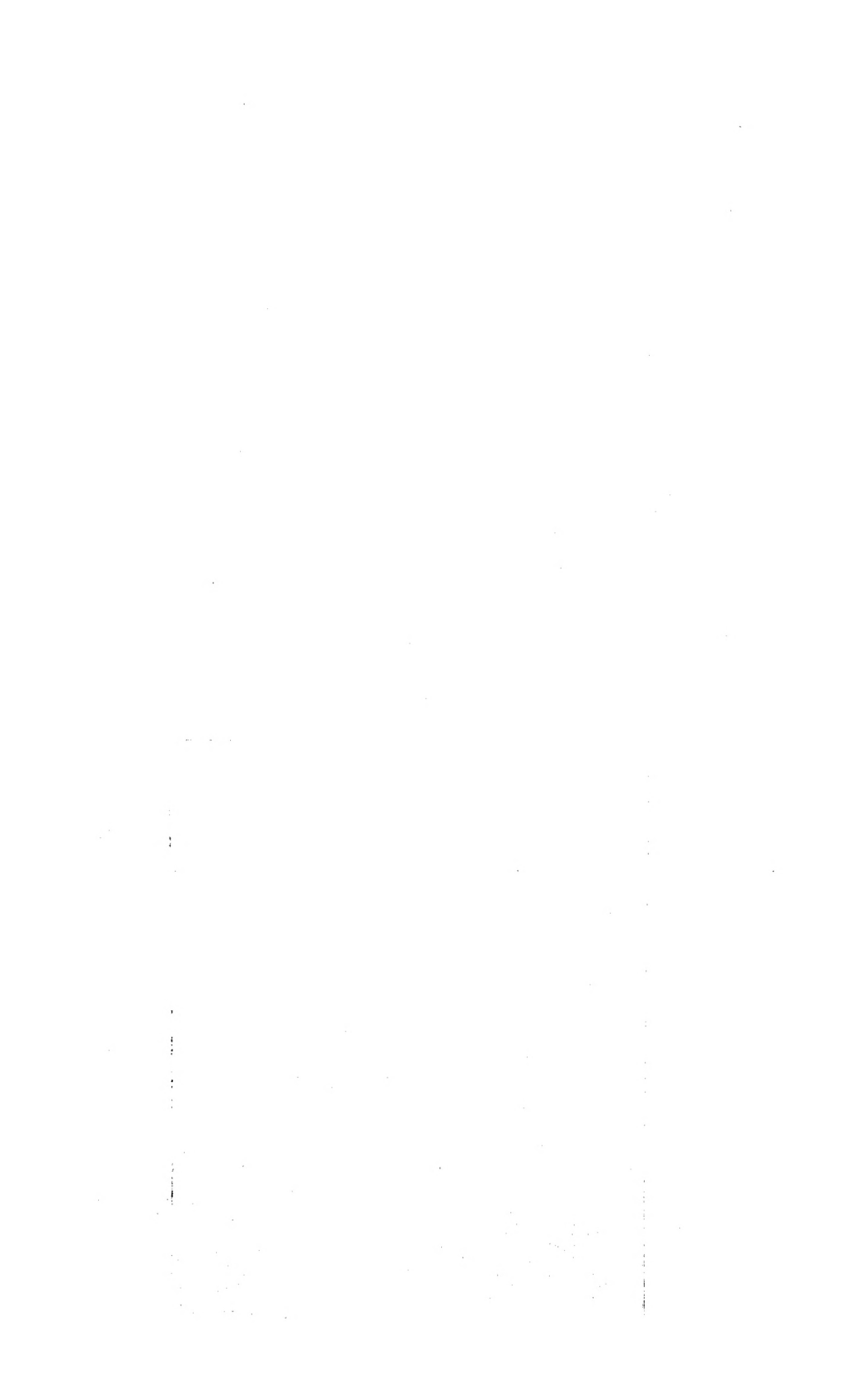
Another feature of the gauze-protected stoep that could advantageously be improved upon is the invariable fixation of the gauze. Although the meshes of the gauze admit air freely, yet this gauze necessarily must be, to some extent, an obstacle to the thorough perfusion of the verandah which it encloses. This is certainly undesirable, especially in hot stuffy weather, and the method adopted with satisfactory results, in the small house of which I enclose a photograph,



Farm Residence with partially enclosed stoep.



The Farm Privy.



is to fix the gauze to moveable wooden frames, hinged at the top. These frames are raised every morning at sunrise and suspended by hooks attached to the ceiling, while at sunset they are replaced. Viewed through gauze all objects lose definition and present a hazy appearance which is certainly disadvantageous; moreover, it is not pleasant to be always encased by gauze much like animals in a cage. That justly-dreaded pest, the anopheles mosquito, need not be feared if the mosquito frames are shut down at sunset.

THE FARM PRIVY, OR LATRINE.—The condition of the privies or latrines in this country, not only on farms but also in hotels and elsewhere, is often most unsanitary. A certain amount of effluvium is inevitable at times in a latrine, and for this reason the building requires to be exceptionally well ventilated, well lighted and clean. It should indeed be the best ventilated room on the premises and if these sanitary conditions do not prevail, the latrine must necessarily become a disagreeable and unsavoury resort. Many of the latrines I have seen on farms and elsewhere in Rhodesia were noisome to a degree, dark, dirty and offensive—places of refuge for vermin and mosquitoes.

The construction, moreover, of the interior of the latrine, wherein there is usually a large platform which stretches completely across the room, is faulty. This system of construction creates recesses on either side of the pail, which are seldom cleaned, wherein refuse accumulates and vermin find shelter. The seat of a latrine does not require to be more than eighteen to twenty-four inches across.

Another objectionable feature is the trap-door at the back of the building for the removal of the receptacle. Owing to the system of removal practised, trap-doors may be indispensable in towns, but they are quite unnecessary elsewhere, for the house boy can easily carry the pail out by the front door as from the back. These trap doors seldom fit accurately, and are seldom fastened when they do fit, consequently the resulting apertures provide vermin with an easy means of ingress to the latrine. They should be abolished wherever feasible. The latrine in the picture has a ventilating arch in usual situation of the trap door, similar to the arch seen in the side wall of the building; and there is a third ventilating

arch in the opposite wall. All three arches are closed with wire gauze, as are also the window, the two lower panels of the door, and the two gable ends of the building. The upper panels of the door are fitted with glass made slightly opaque by rubbing one surface over with sand. The window in the side wall supplies additional light when closed, and air as well as light when open. The result is a well-lighted, well-ventilated, clean, mosquito and vermin proof closet in place of the very frequently pestilential cabinet.

This small building was put up by myself with the aid of a farm boy, so that its erection does not require the services of a professed artisan. I commend it to public notice, for that infection with malaria often takes place in latrines there can be no question.

The inside measurements are 4 ft. by 5 ft., and the walls are 9 in. thick.

The materials used and cost of same are as follows :—

Material.	Cost.
2,000 Bricks	£2 0 0
4 Sheets corrugated iron, 9 ft. long (each cut into two)	1 2 0
1 Door	1 1 0
1 Cottage casement	0 5 9
60 ft. deal, 3 in. x 2 in., for wall plates and rafters	0 13 0
2 Yards iron wire gauze, 6 ft. x 6 ft. ...	0 13 0
Cement for floor, steps and pointing brickwork	0 10 0
2 Panes glass, wood for frames of door, window, etc.	0 15 3
Total	£7 0 0

The best and, at the same time, most convenient deodoriser is finely-powdered dry earth, but this substance rises in clouds when cast into the pail, and is, on this account, sometimes objectionable. Provided it is used in abundance, sand, which is free from this drawback, answers quite well.

MOSQUITO NETS.—The prevalence in Rhodesia of malaria and its congener blackwater fever, renders the use of mosquito nets imperative. The importance of having an

efficient mosquito net does not appear to be fully realised, for the nets seen in use in this country are frequently faulty. If more attention were paid to this matter, the mortality in Rhodesia from blackwater fever would doubtless undergo considerable diminution.

To ensure efficiency the mosquito net should be sufficiently ample to admit of being easily tucked under the mattress of the bed. The netting should be fine enough to prevent the smallest mosquito from penetrating it, twenty meshes to the inch being advisable, for the reason that some of the African anopheles mosquitoes are exceedingly small.

Moreover, owing to its "fluffiness," a cotton mesh of this fineness will give protection against those almost microscopic biting flies which are so prevalent and troublesome at certain seasons of the year. The lowest two feet of the net should consist of two layers of calico, and the net should be so suspended over the bed that, when tucked under the mattress, one foot of the calico portion of the net rests beneath the mattress and one foot extends above. The object of having calico in this situation is not only to strengthen the net so that it can be tucked, and withdrawn from, beneath the mattress without being torn, but also to protect the hands and arms should they, through inadvertence or restlessness, be placed in contact with the net during the night.

Nets which are weighted with shot and fall beyond the bed down to the floor are dangerous, because, during the day, when the net is drawn up, anopheles mosquitoes often seek concealment under the bed. Mosquito nets should invariably be tucked under the mattress. There is a net made called the "Mida" mosquito net, which fulfils the required conditions.

Extraction of Oil from Castor Beans.

The following information concerning the extraction of oil from castor oil beans may be of interest to some of our readers. The information has been supplied by Messrs. Rose, Downs & Thompson, Ltd., of Hull, England, to the Director of the Royal Botanic Gardens, Kew, by whom it has been transmitted to this Department.

Dunster House, 12, Mark Lane,

London, E.C.,

19th April, 1911.

The Director,

Royal Botanic Gardens,

Kew.

Dear Sir,—With reference to the enquiry you have received from the Department of Agriculture at Salisbury, Rhodesia, in connection with the machinery for the expression of Castor Seed oil, we may say that we ourselves claim to be the oldest and largest makers in the world of such machinery, and the present and latest methods of treating Castor Seed is in accordance with the statement made in the letter from the Department of Agriculture. Two of the largest installations of this description have recently been erected by us in Hull for the expression of oil from Castor Seed, and the method which obtains there is briefly as follows:—

The Castor Seed is fed whole, without any preliminary grinding, direct into the press and treated at ordinary atmospheric temperature, thus producing the first quality of cold drawn oil. The cakes made in this first pressing, after the oil has ceased to flow, are taken from the press and reduced to meal, which goes back to the kettle, and for this second pressing steam is admitted to the steam chamber or jacket of the kettle, provision also being made to admit a small portion of live steam to the interior of the kettle should this be necessary in order to enable the remainder of the oil

to flow more readily. This second pressing is carried out with the material heated to a temperature of about 180 deg. Fahrenheit. There is another quality of oil also produced by pressing the seed at a temperature of about 90 deg. Fahrenheit. When treating the seed at ordinary atmospheric temperature the percentage of oil remaining in the cakes would be from 18 to 20 per cent.; when the seed is heated up to a temperature of 90 deg. the oil remaining in the cakes would be got down to about 10 to 12 per cent., but in pressing in this way the oil would be somewhat discoloured instead of being practically white as when pressing cold. All three of these qualities of oil are passed through a filter press with an admixture of Fuller's earth.

The presses which are employed for the treatment of Castor Seed are known as the "Premier" type, the pressing boxes being perforated over their entire circumference with minute holes for the escape of the oil; the larger presses being constructed for a working pressure of 3 tons per square inch, the smaller presses for 2 tons per square inch. Any of the "Improved Premier" mills referred to would be suitable for the treatment of Castor Seed, though all the items shown therein would not be required. We would suggest therefore that you should obtain full particulars as to actual requirements, principally in connection with the quantity of seed to be dealt with in a given time, whether the plant would be worked by day only or night and day, and for what purposes the oil would be used; we should then be in a position to submit a definite quotation for the plant we should recommend.

Presses which are worked in the large factories referred to, are capable of dealing with about 10 cwts. of seed per hour. We hope the foregoing information will be of use.

Hints on Brickmaking.

BY G. S. DYKE.

Having had some practical experience in the manufacture of bricks and having seen Staffordshire blues, Adderley Park reds, Stourbridge fire bricks and Ruabon terra cotta, made by hand and also by the most up-to-date machinery, as well as thousands of bricks made in the Transvaal, I am perhaps able to give a few hints, to those who desire to make bricks for their own use.

First I would impress upon all who intend making bricks that success in brickmaking, like everything else, largely depends on the maker being thorough in every detail from start to finish. I mention this, as I have seen more than one failure, through lack of interest and the leaving of all the work in the hands of kafirs.

The prevailing idea of the amateur in this country is to make his bricks of antheap. Good bricks can be made from this material, but when a large quantity is required, one cannot go to the expense of carting antheap, or making brick, wherever the antheaps happen to be. Both in this country and in the Transvaal, I have found yellow subsoil to be the best material for the manufacture of bricks, and I believe there are very few farms on which it is not to be found. In no case should the top soil be used, as the bricks are sure to crack if it is. To good yellow subsoil should be added clean, sharp sand, ratio three-parts subsoil to one part sand. I have found sand from the mines to be excellent. Particular care and attention should be given to the mixing and puddling of the material.

Excavate one hole in the ground 2 feet deep by 12 x 6 feet wide, with one sheet of galvanised iron on edge across centre, placed in such a manner as to form two equal compartments each 2 ft. x 6 ft. x 6 ft. Mix the dry sub-soil and sand at the side of the holes before adding water, and when well mixed put into the holes and add water as required, put two boys to stamp it into a thick pasty mass, always remembering you cannot puddle it too much. Have a good strong deal table made, 12 ft. x 4 ft. x 2 ft. 4 ins. high, and place same at the edge of the hole so that the clay, as will now call it, can be readily placed on the back of the table with a shovel; always keep the top of the table wet when making.

MOULDS.—These are best made of well seasoned floor boards and large enough to hold three bricks. The inside measurement of each mould should be $9\frac{1}{4}$ inches long, $4\frac{5}{8}$ inches wide, by $3\frac{1}{8}$ inches deep, which size allows for shrinkage in drying and burning. The finished will be 9 in. x $4\frac{1}{2}$ in. x 3 in.; the moulds should be very smooth on the inside, quite square at the corners and parallel from top to bottom. I should advise anyone who is not a good hand at carpentering to have the moulds made by a mechanic. A galvanised iron tank or ordinary bath should be placed at each end of the table, as shown in diagram, and kept well filled with water into which the moulds are put as the carriers bring them back after depositing the bricks on the drying floor. A large space should be cleared on which to deposit the bricks when made, and great care must be taken to have the surface level and smooth, otherwise good shaped bricks cannot be expected. Supposing these preparations to have been made, we are now in a position to commence making the bricks.

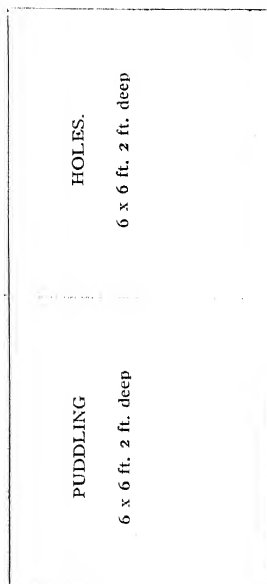
Two boys can work at a table of the dimensions given. The clay in hole No. 1 being ready for use is dumped on the table, each moulder takes a set of moulds from the water tank, dusts them with fine sand, then takes a portion of the clay and slaps it into the moulds, taking care to ram it into the corners. Next draw a straight edge across the top, and the mould is then ready for the carrier to take away to the depositing site. Each moulder should have two boys to carry the moulds away. When the mould is filled with clay,

the carrier should run with it to the drying ground and deposit the bricks by carefully turning the mould upside down and then return and put the mould into the water tank, by which time another mould should be ready for him to deal with in the same manner. When the boys have once got used to the work, two makers should easily turn out 1,000 bricks per day.

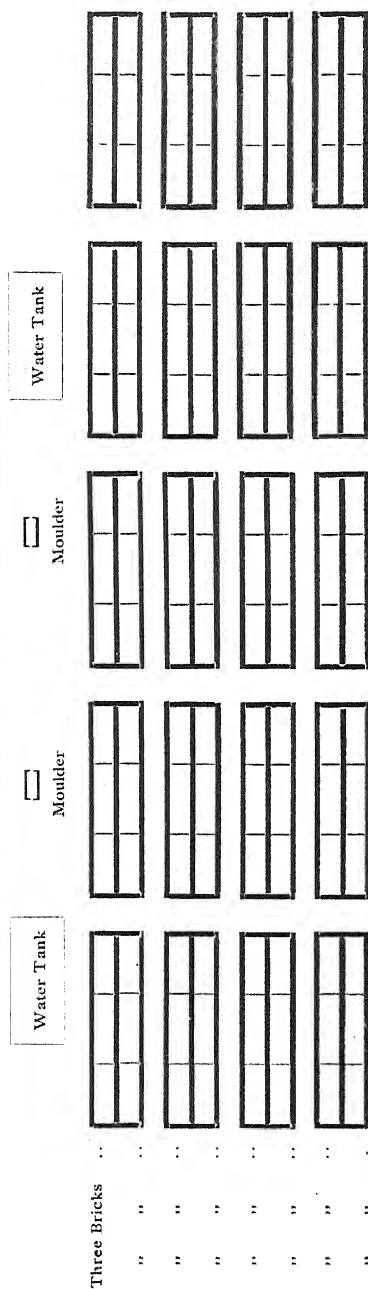
After the bricks are laid on the drying floor, they should be lightly covered with grass or straw. Each day's work will be ready to stack the following morning. The bricks should be stacked on edge with a small space between each brick so that a current of air can pass through and assist the drying process. The stacks should be turned at the end of three days and in six days should be ready for burning. Care should be taken to put a covering of grass or straw over the stacks to keep off the direct rays of the sun, otherwise the bricks will crack. *Re* method of placing bricks on drying ground, puddling holes, table and tanks, see sketch.

The following are the chief points to be observed :—

- (a) Good yellow subsoil mixed with sand three to one.
- (b) The more the clay is puddled the better the brick.
- (c) An addition of fine sifted wood ash improves the brick.
- (d) In no case should any gravel or stones be mixed with the clay.
- (e) Moulds to be put into tanks every time after removing brick.
- (f) Dusting moulds with fine sand ensures bricks leaving readily.
- (g) Bricks must be covered with grass or straw to prevent sun from cracking them.
- (h) A clean, level depositing site ensures a good shape.
- (i) Puddle fresh clay in one hole, while using mixed clay from the other.

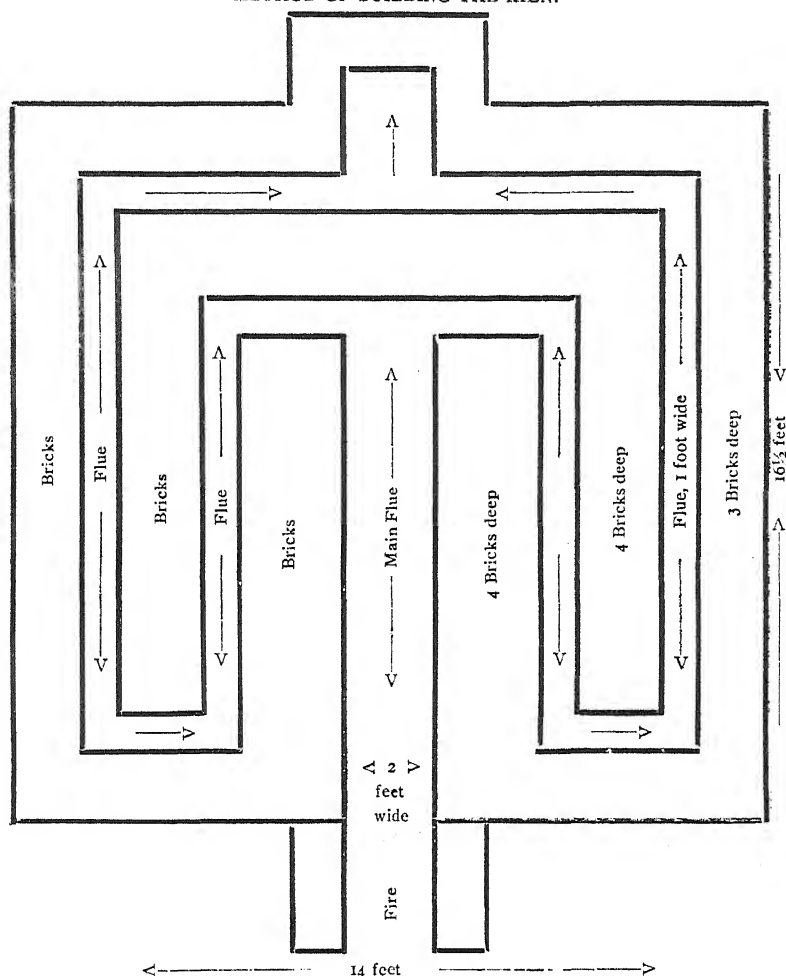


TABLE, 12 ft. x 4 ft. x 2 ft. 4 in.



METHOD OF PLACING BRICKS ON DEPOSITING SITE

METHOD OF BUILDING THE KILN.



A kiln of these dimensions and 9 feet high will hold 25,000 bricks if properly packed. Bricks should not touch in stacking, except of course, on the flat side. Well cover the outside of kiln with dagga before firing. Cover the top of the kiln with old corrugated iron and cover this again with about 4 inches thick of dagga. Burn with a steady wood fire for three days and nights, then stop up all flues and fireplace and in three days the kiln will be ready to open. Six days or more will then be required before the bricks will be sufficiently cool to take out.

Great care must be taken throughout the whole process until the bricks are in the kiln, to prevent rain falling upon them and for this reason brick making is an operation for the dry season.



Gland Puncture. Methods of obtaining Gland Substance for the diagnosis of African Coast Fever.

The Diagnosis of African Coast Fever.

GLAND PUNCTURE.

By L. E. W. BEVAN, M.R.C.V.S.,
Government Veterinary Bacteriologist.

The diagnosis of African Coast Fever may be based on (1) the presence of the parasite (*Theileria parvum*) in the red blood cells, (2) the so-called Koch's bodies in the glands, spleen and other organs.

While other parasites closely resemble *T. parvum*, Koch's bodies are diagnostic of African Coast Fever, and being an early stage in the life cycle of the parasites, are met with in the gland and spleen some days before *Theileria parvum* can be detected in the blood.

It is often of the greatest importance that an early decision shall be arrived at as to whether an animal is suffering from the disease, and valuable time may be saved by forwarding gland smears as well as blood smears for diagnosis by microscopic examination at the Veterinary Laboratory, Salisbury.

The accompanying photographs and description show how this comparatively simple operation may be performed. These were first sent to members of the Veterinary Staff only, but the results have been so satisfactory that it is thought that many farmers may be able to make preparations with equal success.

The animal having being secured against a fence, the head should be drawn round towards the operator, who stands on the left side, and seizes with his left hand the large gland in front of the shoulder. The hair over the gland is removed and the area is washed with an antiseptic and dried. Holding the gland firmly imprisoned under the skin, the operator

introduces the needle of a hypodermic syringe into it from below, upwards, and attaching the barrel of the syringe draws up the gland juice by withdrawing the piston. For this purpose it is advisable to use a needle having a large bore. With some animals it is somewhat difficult to manipulate the syringe single-handed, and it may be found easier to attach a piece of rubber tubing to the needle exerting suction from the mouth as shown in the photograph.

If the animal is too wild or restless it may be necessary to throw it, and to operate upon the gland of the flank which lies slightly above and in front of the point of the stifle.

The substance removed should then be placed on a clean microscopic glass slide and spread after the manner of a blood-film. The wound should then be washed with anti-septic, and usually heals rapidly.

When no apparatus is available very little damage is done by cutting boldly into the gland and removing some gland and removing some gland substance by scraping with the point of the knife.

Notes from the Agricultural Laboratories.

BOTANICAL.

In the AGRICULTURAL JOURNAL, Vol. VIII., No. 3, February, 1911, page 434, a note appears on Indigenous Rubber, and it is stated that the Muliga Rubber tree is similar to the M'Toa of Southern Rhodesia, and is botanically known as *Gonioma Kamassi*.

This botanical determination is incorrect, and arose in the following manner: The M'Toa tree, or Rhodesian Rubber tree so called, is extremely common in Southern Rhodesia. and on the writer's arrival in Salisbury there were several mounted herbarium sheets of M'Toa labelled *Gonioma Kamassi*, Mr. C. F. H. Munro, in his list, "Some Indigenous Trees of Southern Rhodesia," also describes M'Toa under the botanical name of *G. Komassi*.

How this double error occurred is unimportant—the fact remains, however, that the correct determination of the Muliga rubber and the M'Toa, which are identical, is *Diplorhynchus mossambicensis*, Order Apocynaceae. Mr. T. R. Sim, in his "Forest Flora of Portuguese East Africa," reports the latter tree as plentiful in that Territory, and its appearance in Rhodesia is not therefore surprising, since the adjoining territories have many trees and plants in common.

The true *Gonioma Kamassi*, as far as the writer is at present aware, does not occur in any part of Rhodesia, and indeed, as far as South Africa is concerned, its recorded appearances are confined to the lower forests of the Midland Conservancy of the Cape Province, and sparingly along the coast as far as East London. The timber is reserved in all the Cape conservancies except the Transkeian, where it is not known to occur (Sim, Forest Flora, Cape Colony.)

Gonioma Kamassi is the Kamassi wood of the Cape, and is much valued as a substitute for Boxwood, under which name

very considerable quantities of this wood have been exported to Europe.

It will be seen, therefore, that had the M'Toa tree actually been *Gonioma Kamassi*, Rhodesia would have possessed an abundant supply of what is considered a timber of no little value. Unfortunately, however, this is not the case, and according to the report in the February issue of the AGRICULTURAL JOURNAL, even the latex of the M'Toa possesses no commercial value.

H. G. MUNDY.

Notes on Cheese Making.

By an Attendant at one of Miss Maidment's recent Lectures.

WENSLEYDALE CHEESE.

Wensleydale cheese is made from new milk, or from a mixture of morning and evening milk. The evening milk should, if possible, be kept until the morning at a temperature of 64 to 68 degrees.

In the morning mix the morning and evening milk's cream, and heat the whole to 82 to 84 degrees, adding one drachm of rennet to every four gallons of milk used in the production of the cream. The rennet used should preferably be out of stone bottles (Do not use rennet kept in glass bottles, as it should never see the light). A good plan is to extract a small quantity of rennet from the large bottle, and place it in a small stone bottle, thus avoiding opening the large bottle as much as possible.

Turn the mixture into a cheese cloth to drain for 12 hours, keeping it covered up to prevent the temperature from falling, and leave it draining until it is acid enough to salt. Now place the curd into moulds, without any pressure, for 12 hours, when it should be turned and pressed for 6 hours, and turned again and pressed for another six hours.

It can now be turned out and bandaged (a cheese cloth being sewn round it), and placed in a room to ripen in a temperature of 60 to 62 degrees, the room being well ventilated but not draughty, as a draught might cause the cheese to crack. The cheeses must be turned every day, and at the end of 10 days should be dry enough to dip into paraffin wax (which should be boiling), this will prevent the cheese from further drying and cracking. Should the cheeses not be dry enough at the end of ten days leave them a little while longer.

At the end of eight weeks they should be ready for eating, after 10 or 12 weeks, however, they will be found ripper and in better condition.

It is best to set the milk for these cheeses in a wooden tub, wood being a non-conductor, but if not in wooden utensils, the milk should at least be set in enamelled vessels, and cooled in hot weather. Refrigerated milk should never be used for making this cheese.

CREAM CHEESE.

"Rhodesian Cheese de luxe."

Made with equal parts of sweet milk and cream. The cream should hold about 30 per cent. of fat.

TEMPERATURE.—Cream should be set at 60 degrees, and should be kept at this temperature, and not allowed to fall below it.

RENNET.—To one gallon of milk add one tenth of a cubic centimetre of rennet.

Stand the cream for 24 hours, until it attains the consistency of coffee cream; then ladle it out in thin layers into a hucka-back cloth, and drain for 12 hours or longer, until firm enough to be rolled up and pressed. Put in salt at any stage to check acidity. Before rolling and pressing, half an ounce of salt to every 4 pounds of curd should be added.

Mould into 4 oz. squares, and use a bone paper knife for finishing off and flattening purposes. While draining, open the cloth now and again, and scrape down the cheese from the sides of the cloth.

The Migratory Habits of the White Stork or Great Locust Bird

(*Ciconia Alba*).

The following letter, received from the Director of the Ornithological Society of Budapest, will be of interest to all South African ornithologists. The bird in question was found dead in the Melsester district on December 28th, 1910.

Kir. Magyar Orinithologiai Központh,
Royal Hungarian Central Bureau for Orinithology,
Budapest, March 15th, 1911.

The Director,
Department of Agriculture,
Salisbury.

Sir,—In reply to your letter, No. 639/57, of February 7th, I have first of all to thank you for your very interesting information.

As for the particulars in reference to the bird in question, I beg to state that it was a White Stork, marked on the nest, while a fledgling, with ring No. 2537, on the 1st July, 1910, at Egri, a parish in Hungary (N. lt. 47° 50', E. lg. 40° 40' from Ferro).

The marking of birds was taken up in 1908, and in 1910 about 1,000 young storks were marked.

From the attached list you will see how many storks have been captured in South Africa, and that one now reported by you is the first one from Rhodesia, thus forming a valuable link in the research of migration.

It may also interest you that of the storks marked at Egri, one was found at Okonjati Farm in German S.W. Africa, and one at Jerusalem.

I have the honour to be, Sir,

Your obedient servant,

OTTO HERMAN,
Director, H.O.C.

HUNGARIAN RINGED STORKS IN SOUTH AFRICA.

MARKED IN HUNGARY BY MEANS OF NUMERED
ALUMINIUM RINGS.*Royal Hungarian Central Bureau for Ornithology, Budapest,
Hungary.*

1. Marked on July 10th, 1908, ring No. 289, at Hidveg, 45 deg. 50 min. N.Lt., 43 deg. 15 min. E.Lg. Killed on January 30th, 1909, at Seaforth, Himeville, District Polela, Natal, about 30 deg. S.Lt., 48 deg. E.Lg. Distance about 8,600 kms. Reported by Mr. Peter MacKenzie in "Times" issue of March 3rd, 1909.

2. Marked on June 26, 1909, ring No. 1415, at Bogyan, 45 deg. 25 min. N.Lt., 36 deg. 45 min. E.Lg. Killed on November 22nd, 1909, at Lake Banhager, Ermelo District, Transvaal, about 26 deg. 30 min. S.Lt., 40 deg. E.Lg. Distance about 8,100 kms. Reported by Mr. E. Pearse in "East London Daily Dispatch," December 1, 1909, and Mr. H. Meyer in "De Volkstem," of December 6th, 1909.

3. Marked on June 26th, 1909, ring No. 1432, also at Bogyan, Killed on November 28th, 1909, at Glenco Junction, Natal, about 28 deg. 20 min. S.Lt., 48 deg. E.Lg. Distance about 8,300 kms. Reported by Mr. George E. Mathews.

4. Marked on July 5th, 1909, ring No. 2054, at Rakamaz, 48 deg. 10 min. N.Lt., 39 deg. 10 min. E.Lg. Killed on December 14th, 1909, at Lehloenyas, Marija, Basutoland, about 29 deg. 40 min. S.Lt., 45 deg. 30 min. E.Lg. Distance about 8,750 kms. Reported by Mr. Miles Capstick, jun.

5. Marked on July 13th, 1909, ring No. 2298, at Rety, 45 deg. 50 min. N.Lt., 43 deg. 40 E.Lg. Killed in December, 1909, at Senekal, Orange River Colony, about 28 deg. 20 min. S.Lt., 27 deg. 30 min. E.Lg. Distance about 8,500 kms. Reported by Mr. P. Stahl.

6. Marked July 8, 1908, ring No. 152, in Batiz, 47 deg. 50 min. N.Lt. 40 deg. 40 min. E.Lg. Found dead December 31st, 1909, near Cana, Basutoland.

7. Marked June 27th, 1909, ring No. 1594 in Dunaörs, 47 deg. 46 min. N.Lt., 35 deg. 46 min. E.Lg. Found dead January 18th, 1910, in Rabenthal, Boshof, O.R.C. Distance 8,700 kms.

8. Marked July 8, 1908 in Egri, Com., Szatmar, ring No. 287, 47 deg. 50 min. N.Lt., 40 deg. 40 min. E.Lg. Killed in January, 1910, in Okonjati, near Okonjati, near Okawa Kuatgiwe, in German South West Africa. Reported by Carry Vernuleth.

9. Marked July 3rd, 1909, in Tissakessi, Com., Borsod, ring No. 2002, 47 deg. 45 min. N.Lt., 38 deg. 40 min. E.Lg. Killed end of February, 1910, near Utrecht, Natal. Distance 8,400 kms. Reported by "De Volkstem," Pretoria, 3rd August, 1911.

10. Marked July 2nd, 1908, in Alsosoig, Com., Vas., 47 deg. 14 min. N.Lt., 34 deg. 49 min. E.Lg. Killed by hail in January, 1910, at Cradock, Cape Colony. Distance 8,900 kms. Reported by Starr Garlake.

11. Marked July 8th, 1909, in Deregnyo, Com., Femplin, ring No. 2199. Found dead on July 10th, 1910, at Glencairn, Natal. Reported by Mr. E. Munder.

12. Marked July 6th, 1910, at Tusa, ring No. 3856. Recovered on November 25th, 1910, at Avondale, Transvaal. Reported by the Central Locust Bureau, Pretoria.

13. Marked June 19th, 1910, ring No. 3198, at Srentfulop. Found dead at Waterkloof, on December 15th, 1910. Reported by "De Volkstem."

14. Marked June, 1909, ring No. 1952, at Bellye. Killed by accident on February 28th, 1910, on Smalkloof farm, near Volksrust. Reported by Mr. Lansberg, Volksrust.

15. Marked July 9th, 1910, at Rakamar, ring No. 3606. Recovered at Pietersburg, Transvaal, in January, 1911. Reported by the Director, Transvaal Museum, Pretoria.

16. Marked June 26th, 1910, ring No. 1938, at Bellye. Found dead at Tigalara Farm, Bashee, Cape Colony. Reported by Mr. Eli Tom Ball, Mount Ayliff.

Veterinary Report for February and March, 1911.

BULAWAYO.

AFRICAN COAST FEVER.—Fresh outbreaks occurred at several native kraals on the farm Ballarat, and one on the Sauerdale Block. The affected herds are now in process of removal to clean veld through temperature camps.

The cattle belonging to Col. Napier, Mr. Huntley and the native cattle on Copthall Block have now been on clean veld for several weeks without any reappearance of disease.

No further cases have occurred at the native kraal Hope-fountain, reported infected in my last report.

MALLEIN TEST.—The following animals were tested on entry and found healthy :—

Horses ...	... 173
Mules ...	... 328
Donkeys ...	... 223

SALISBURY.

AFRICAN COAST FEVER.—After an interval of four months a recrudescence of the disease occurred on Messrs. McChlery's farm Gillingham, one beast died and the herd was at once removed to another portion of the farm. It is interesting to record that after removal one young animal shewed a high temperature for a few days; gland smears on one occasion showed Koch's Bodies. This animal showed very little signs of illness and recovered quickly.

MALLEIN TEST.—The following animals were tested on importation and found healthy :—

Horses ...	... 41 (includes Jan. and Feb.)
Mules ...	... 75

SELUKWE.

SUSPECTED AFRICAN COAST FEVER.—Constant supervision failed to detect any evidence of Coast Fever, and the herds were released at the end of April.

RUSAPE AND INYANGA DISTRICTS.

AFRICAN COAST FEVER.—Several fresh outbreaks have occurred at native kraals along the infected Inyanga-Rusape Road, and on a farm upon which transport cattle used to be outspanned. A bull died at Inyamsitza, and its kidneys proved to be badly infarcted, but no positive microscopical diagnosis was obtainable. Five animals have been stabled and kept under observation, whilst the main herd has been shifted to clean veld.

The disease has been eliminated from one European and four native herds. One of the herds, which had been released from the temperature camps broke back to the infected veld, and has again been put under observation.

The Inyanga Estate cattle shew a great improvement, and the elimination of Coast Fever from these herds would appear to be in sight.

HARLEY.

FLY DISEASE (*Trypanosomiasis*).—The Cattle Inspector reports that no deaths have occurred; four cases have broken out at Gatooma, but the oxen, although in very poor condition, are still alive.

HORSESICKNESS.—Seven deaths in horses have occurred at Gatooma.

UMTALI.

REDWATER.—The outbreak of Redwater in the newly imported Jerseys on Inodzi shows improvement.

HORSESICKNESS was rife during March.

The season has been an exceptionally wet one and detrimental to the small stock.

ENKELDOORN.

The wet weather has been adverse to sheep.

HORSESICKNESS.—Two cases in mules.

MAZOE.

Some enteritis in calves.

HORSESICKNESS has been very severe, some reputed salted horses and inoculated mules have died.

INSIZA.

HORSESICKNESS has been very prevalent.

MELSETTER.

AFRICAN COAST FEVER.—No extension of the disease from Tilbury.

E. M. JARVIS,

Acting Chief Veterinary Surgeon.

22nd May, 1911.

Reviews.

We have lately received information regarding a useful work of reference which will shortly be published by the Argus Printing and Publishing Co., Cape Town, namely, the "South African Almanac and Reference Book, 1911," which it is stated will take the form of an authoritative guide on most matters appertaining to public interest.

It is intended that this book shall take the form of a South African Whitaker's reference and will cover such subjects as the social, commercial, political, sporting and industrial affairs of South Africa. The book will be illustrated with maps and diagrams, and will deal with all the South African Provinces and Territories, including Rhodesia, under which heading appears a reference to "Rhodesian Pioneers." The "South African Almanac and Reference Book" is expected to appear in print during the month of May or June.

Correspondence.

DRY FARMING IN U.S.A.

The following extract from a letter addressed to one of the officials of the Agricultural Department may be of interest to farmers in Southern Rhodesia. The rainfall in South Dakota occurs during the summer months, from March to September:—

“No doubt you can apply many of the principles and practices that the Western dry farmer uses in his farming to good advantage in your work in Rhodesia.

I have this fall made two different trips into the West: one of them extending clear to the coast, and back through a different section of the country; the other one taking in especially the State of South Dakota. I have been greatly impressed by the wonderful results secured by the farmers of our semi-arid districts. In one instance I saw a field of wheat and the yield of grain was 36 bushels per acre, grown with a total rainfall of less than 11 inches. This, of course, is total precipitation, not rainfall only.

In South Dakota I found areas, where they had this year, on a total precipitation of 10·5 ins., which fell between January 1st and November 25th, which produced 19·6 bushels of barley, 18 bushels of Durum wheat, 13 to 14 bushels of common wheat, 20 bushels of maize, and 20 bushels of sorghum (kafir-corn). The total precipitation during the growing season was 6 ins., and the average precipitation for the State is 16·32 ins.”

[NOTE.—It will be noticed that in the above instances the precipitation occurs during the growing season of the crop, and dry farming in South Dakota is therefore somewhat different from much of the dry farming which has been attempted in South Africa. In the latter country the main endeavour has been to conserve the moisture precipitated during the summer in order to grow a crop in the winter entirely unassisted by rainfall. This is naturally a more severe test than the growing of a summer crop which benefits even to a small extent by the rainfall.—EDITOR].

RAILWAY RATES FOR THE IMPORTATION OF STOCK FROM THE CAPE PROVINCE.
TRUCK LOADS.

STATIONS.	Cattle, Horses, Mules, Donkeys over 13 hands	Donkeys under 13 hands	Calves, 3 months and under 18 months	Sheep, Goats and Pigs.
Port Elizabeth to Vryburg	20/1 per head	20/1 per head less 25%	20/1 per two head	22/11 per 6 head
Queenstown to Vryburg	17/1 per head	17/1 per head less 25%	17/1 per two head	19/6 per 6 head
Vryburg to Bulawayo	Large or small stock	£9 11s. 11d. per short	truck any number	
Bulawayo to Gwelo	"	£3 13s. 0d.	"	
"	"	£5 18s. 0d.	"	
"	"	£8 9s. 0d.	"	
"	"	£16 8s. 0d.	"	
"	"	£10 19s. 0d.	"	
Umtali	"	"	"	
Average load per short truck is 10 Large Animals, and from 50 to 60 Small Animals. The capacity of a large truck is double this quantity.				

SINGLE ANIMALS.

STATIONS.	Large Animals	Small Animals in Crates or Hampers
Port Elizabeth to Vryburg	Minimum charges as for 4 head at 20/1 per head	14/9 each animal
Queenstown to Vryburg	Minimum charges as for 4 head at 17/1 per head	12/8 "
Vryburg to Bulawayo	Charges as for short truck	22/0 "
Bulawayo to Gwelo	"	4/9 "
"	"	8/2 "
"	"	12/7 "
"	"	15/10 "
Umtali	"	19/8 "

Extract from S.A.R. Tariff Book, Clause 197. Small animals (excluding dogs) and including sheep and goats when not transported loose in truck loads, will only be accepted for transport in cases, crates, etc., or in such other manner as may be approved of by the administration.

If sent by Passenger Train, for each sheep, goat, etc., the rate will be ordinary Parcels charges calculated on a minimum of 150 lbs. weight.

If transported by goods train, charges are computed at Rate No. D, subject to a minimum weight of 150 lbs. being paid for on each sheep, goat and the like.

Agricultural Reports.

The season has been a somewhat unusual one, and though a great number of districts have now recorded a rainfall rather above the normal, many crops have suffered from drought and others again from excessive moisture. April, generally speaking, was a dry month, but during the second week in May cold and wet weather was prevalent throughout many districts, and though beneficial to some late sown crops the general effects appear to have been injurious.

The total maize crop throughout the Territory is likely to be about the same as last season; although the acreage is larger, individual crops will be considerably lighter, and in some districts no little loss has been incurred amongst early-matured maize owing to the May rains.

The acreage planted to tobacco should show a considerable increase over previous years, but it is doubtful whether the quality of the leaf will be quite equal to that of last season. Farmers relying on sun-curing their crops experienced loss owing to the late rains, and this appears to have been particularly the case in the Mazoe district.

The veld in most parts is good, and a larger amount of hay has been cut this season than in any previous year. Here again, however, the unusually late rains proved injurious, and much of the hay will be lacking in quality.

Owing to relatively poor prices the acreage planted to potatoes is reported to be smaller than usual, and prices seem likely to rule high. Beans and ground nuts have generally done well, and supplies should be somewhat freer.

Native crops throughout the territory are reported to be fairly good, and there is no likelihood of a shortage of food supplies amongst the natives. Rapoko and Rukwedza crops are particularly good, but the growing of Mashona rice is yearly becoming less general.

Owing to periods of drought, followed by heavy rains, Maize Blight is more prevalent than has been previously recorded. This is particularly noticeable in the Salisbury district, which last year was comparatively free from this disease. The most effective remedial measures appear to be rigid selection of seed from blight resistant plants since cultural methods appear to have but little effect in reducing the pest.

From the outside districts several reports have been received regarding excessive damage to crops by wild pigs, and the opinion is expressed that these animals are increasing in number. It seems more probable, however, that closer occupation of the land is driving the pig to the more remote districts, with the result that the farms in those parts suffer accordingly.

With the exception of those centres where African Coast Fever is rife, farm stock of all kinds is thriving well, and the increase amongst European and native stock is reported as good. On the granite veld losses amongst small stock are reported, owing to wire worm and ticks. Horse-sickness appears to have been less prevalent than in previous years, more particularly within the townships.

Weather Bureau.

TEMPERATURES.

STATION.	MARCH.		APRIL.	
	Max.	Min.	Max.	Min.
Bulawayo	74·8	57·3	75·6	51·2
Chicongas Location	80·5	60·5	79·8	54·3
Chishawasha	77·6	56·9	77·3	50·7
Empandeni	79·0	58·7	75·2	48·2
Gwelo	77·0	55·2	76·2	47·7
Hope Fountain ... ..	...	...	74·3	51·0
Matopo Park	73·6	56·0	77·9	50·3
Melsetter	70·5	...	67·2	...
Mount Selinda	73·9	58·4	...	...
Plumtree	76·1	58·2	76·5	53·6
Salisbury	76·7	55·5	77·0	50·4
Shamva Mine	80·3	...	79·8	...
Sinoia	82·0	57·2	81·9	47·3
Tuli	86·7	...	...	...
Umtali	80·2	49·3	80·1	54·4
Victoria	76·6	59·1	75·5	51·4
Victoria Falls	83·2	62·2	...	...
York Farm, Inyanga	70·6	52·0	71·6	47·7

RAINFALL.

STATION.	March	April
MASHONALAND—		
Banket Junction	2·91	...
"Brundret" (Mazoe)	4·85	1·12
Charter (Meikle's Farm)	4·95	0·37
Charter (Range)	2·67	1·81
Chicongas Location	2·96	0·94
Chilimanzi	1·87	2·48
Chiningo	6·69	2·02
Chishawasha	4·17	1·14
Darwin	5·85	0·03
Driefontein	0·96	2·08
"Eagle's Nest" (Makoni)	5·84	0·64
Eldorado	4·44	0·69
Enkeldoorn	1·95	1·65
Gadzema	1·50	0·42
Gatooma	0·82	0·86
Gatooma, Railway Station ... ..	...	0·95
"Grassfell" (N. Melsetter)	11·50	...

RAINFALL—*continued.*

STATION.				March	April
MASHONALAND—(Continued)					
"Grootfontein" (Umvuma)	...	...	...	1'11	2'19
Gungunyana	...	...	...	10'86	16'71
Gutu	...	...	...	2'46	0'84
"Hallingbury" (Hartley)	...	...	...	0'87	0'75
Hartley	...	...	...	...	...
Hartley, Railway Station	...	...	...	1'68	...
Helvetia (Melsetter)	...	...	...	9'62	1'96
Inyanga	...	...	...	...	0'98
Inyanga Police Camp	...	...	...	6'44	...
Kanyemba	...	...	...	2'70	1'20
Lone Cow Estate	...	...	...	5'55	0'52
Macheke	...	...	...	5'42	...
Makwiro	...	...	...	5'49	1'17
Marendella	...	...	...	4'24	...
Mazoe	...	...	...	7'19	...
"Meadows," Salisbury	...	...	...	4'95	1'96
Melsetter	...	...	...	12'47	1'52
Monte Cassino	...	...	...	3'66	0'75
Morgenster	...	...	...	5'59	1'51
Mrewa	...	...	...	5'58	0'65
M'toko	...	...	...	2'91	0'12
Mount Selinda	...	...	...	11'59	...
'Pamshava	...	...	...	6'76	...
Rusapi, Police Camp	...	...	...	...	...
" Railway Station	...	...	...	4'88	...
Salisbury	...	...	Forest Glen	6'40	0'57
			Gaol	5'97	1'02
			Laboratory	5'50	...
			Public Gardens	6'67	1'03
			Railway Station	5'79	0'95
Shamva	...	...	West Ridge	6'61	1'04
			...	4'90	0'95
			...	7'08	1'25
			...	6'30	0'16
			...	...	2'75
"Tom's Hope" (N. Melsetter)	...	...	...	...	...
Umtali	...	...	...	3'10	...
Umtali Railway Station	...	...	...	3'47	...
Umvuma	...	...	...	2'69	0'60
"Utopia," Umtali	...	...	...	4'68	1'25
"Vermont," Melsetter	...	...	...	10'33	2'10
Victoria	...	...	...	2'30	0'41
York Farm, Inyanga	...	...	...	4'84	0'70
MATABELELAND—					
Balla Balla	...	...	...	1'79	...
Bembezi	...	...	...	1'19	...
Bulawayo	...	...	Observatory	2'19	0'11
			Government House	2'37	Nil
			Railway Station	1'79	...
Empandeni	...	...	...	1'41	...
Filabusi	...	...	...	0'97	0'42
Globe & Phoenix	...	...	...	1'16	...
Gwaai	...	...	...	1'35	0'02

RAINFALL—*continued.*

STATION.	March	April
MATABELELAND—(Continued)		
Gwanda	0'50	...
Gwelo Railway Station	1'40	0'60
Heaney Junction	2'03	...
Hope Fountain	2'68	0'53
Insiza	0'50	...
Inyati	1'72	0'63
Malindi	1'89	0'22
Marula	2'48	2'54
Matopo Mission	2'73	0'31
Matopo Park	2'16	0'49
Maxim Hill (Bubi)	0'81	...
Mtshabzi Mission	2'09	0'31
Nyamandhlovu	2'63	...
Plumtree	2'64	0'05
Que Que ... ..	...	1'26
Rixon	0'39	0'80
Selukwe	2'60	...
"Shawlands" (Gwelo)	0'45	1'10
Solusi	1'85	0'44
Syringa	3'92	0'90
Tegwani	2'61	0'03
Tuli	0'86	...
Umguza ... ..	...	...
Victoria Falls Railway Station	1'16	...
" " Police Camp	2'25	Nil
Wankies (Railway Station)	2'77	...
West Nicholson	1'50	...

Market Reports.

There has been a further advance in maize in the Home market, and Messrs. Fear, Colebrook & Co., Ltd., report that at the end of April this grain was about 1/- per quarter dearer. There is also a slight advance in oats and wheat. This firm gives the following prices:—

South European round yellow maize, 23/6 to 24/- per 480 lbs.

South African round yellow maize, 23/- to 24/- per 480 lbs. c.i.f., or 8/6½ to 8/11½ per bag free on board.

Argentine maize is scarce.

River Plate oats, c.i.f. to the United Kingdom, is now 14/- to 14/3 per 304 lbs. and South African oats about 3d. per quarter more than the above, or equal to 5/11 to 6/0½ per bag free on board.

Red wheats, 30/6 to 35/-, white wheats, 34/- to 35/6 per 480 lbs. c.i.f.

We are indebted to the following firms for prices supplied: Messrs. Fear, Colebrook & Co., Ltd., Southampton; Messrs. Jas. Lawrence & Co., Ltd., Kimberley; Johannesburg Produce Commission Agency, Johannesburg; Messrs. Wightman & Co., Ltd., Salisbury; Messrs. Whitfield & Co., Salisbury.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	11/0 13/6	9/6 12/6	—	30/0 35/0
Beans, per 200 lbs. ...	—	—	—	32/6
Beans, Sugar ...	25/0 32/6	20/6 30/6	—	—
Beans, kafir, per 203 lbs. ...	15/0 20/0	20/0 21/6	—	—
Boer Meal, unsifted, per 200 lbs. ...	—	23/6 25/6	—	45/0 47/6
Boer Meal, sifted, per 200 lbs. ...	22/6 26/0	26/0 28/6	42/0 43/0	47/6 50/0
Bran, per 100 lbs. ...	6/3 6/6	7/0 7/6	14/0 14/6	12/6 17/6
Flour ...	—	—	—	17/6 25/0
Flour, Colonial 100 lbs. ...	—	15/6 16/6	22/0 22/6	20/0 26/0
Forage, T'vaal, 100 lbs. ...	—	—	—	—
" O.R.C. ...	—	—	—	—
" Colonial " ...	—	4/9 5/3	—	—
" Oat " ...	4/9 5/3	—	12/6 13/0	12/0
Hay, per bale ...	—	—	—	3/6 4/0
Kaffir Corn, White, per 200 lbs. ...	10/0 10/6	10/6 12/0	8/0 8/6	—
do. Mixed 200 lbs. ...	10/0 10/6	—	—	—
Manna, per 100 lbs. ...	2/3 3/0	—	—	—

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Mealies, S.A., White per 200 lbs. ...	9/6 9/10	11/6 12/0	10/0	8/0 8/6
Mealies, S.A., Yellow, per 200 lbs. ...	9/6 9/9	—	9/0 9/6	—
Mealie Meal, White, per 200 lbs. ...	—	11/6 12/0	—	—
Manga, per 200 lbs. ...	—	—	—	10/6 12/0
Monkey Nuts, per lb. ...	—	—	3½d. 4d.	—
Oats, per 150 lbs. ...	8/0 9/6	10/6 10/9	20/0 21/0	25/0 27/0
Onions, per 120 lbs. ...	13/6 14/6	8/0 12/6	20/0 21/6	— 35/0
Peas, per 200 lbs. ...	11/6 13/0	—	—	—
Potatoes, per 150 lbs. ...	9/6 10/6	5/0 15/0	9/0 11/6	9/0 10/6
" O.R.C. ...	—	—	—	—
" New ...	10/0 11/3	—	—	—
Rapoko ...	—	—	—	9/0 10/0
Rye, per 200 lbs. ...	10/6 10/9	—	—	—
Salt, per 200 lbs. ...	—	3/0 4/0	10/6 11/6	13/0 15/0
Tobacco, good, per lb ...	3½d. 5d.	4d. 7d.	—	—
" inferior, per lb ...	—	1d. 2d.	—	—
Wheat, per bag 203 lbs. ...	17/6 20/0	18/6 20/6	—	30/0
Butter, per lb. ...	11d. 1/0	11d. 1/2	1/3 1/6	1/6 2/6
Butter, second quality ...	9d. 10½d.	9d. 10d.	—	1/0 2/0
Eggs, per doz. ...	1/11 2/0	1/3 2/0	3/0 3/9	—
Ducks, each ...	1/6 2/3	2/0 2/9	3/0 3/6	4/6
Fowls, each ...	1/11 2/3	1/0 2/0	1/0 1/8	4/6
Geese, each ...	4/0 4/6	—	—	12/6
Turkeys, each ...	7/6 10/6	3/0 10/0	7/6 8/3	£1
Oranges, per 100 ...	—	—	—	—

LIVESTOCK.

Horses ...	£12 £20	£10 £25	£15 £24	£25 £30
" Mares ...	—	—	£17/10	—
Mules ...	£17/10 £25	£20 £25	£30 £35	£30
Donkeys, geldings ...	£5 £6/10	£4/10 £7	£7 £8	—
" mares ...	—	£5 £7/10	£9 £11	—
Cows, Dairy ...	—	—	£25 £35	£25 £30
Cows, Native ...	—	—	£7/10 £9/10	£10
Heifers, Colonial ...	—	—	£8 £17/10	—
Heifers, Native ...	—	—	—	—
Oxen, Trained ...	—	£7 £8	£8/10 £11/10	£10
Oxen, Ordinary ...	£10 £13	—	—	—
Cows, Slaughter ...	£7 £9	£7 £8	—	—
Oxen, good ...	£11 £13/10	£10/10 £13/10	—	—
Oxen, medium ...	—	£8 £9	—	—
Calves, ...	—	£2 £3/10	—	—
Sheep, ...	—	14/0 17/0	10/0 15/0	£1
Lambs, 30 lbs. ...	8/0 10/6	8/0 10/0	—	—
Hamels ...	14/0 15/6	12/6 17/6	—	—
Kapaters ...	—	—	—	—
Pigs, clean, per lb. ...	3d. 3½d.	3d. 3½d.	3d. 4d.	4d.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing ; Maize selection and maintenance of the breeding plot ; Points of maize and maize judging, with demonstrations ; Utilisation of granite vlei soils ; Ground nut culture ; Rotation crops for home use and for sale ; Veld improvement by winter grasses ; Production of foodstuffs for the mines ; Ensilage ; Fungoid diseases of maize and wheat ; Wheat, oats, and lucerne under irrigation ; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease ; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught ; feeding and kraaling of live stock ; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility ; The principles of manuring ; the value of lime in agriculture ; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm ; the role of insects and their allies in the transmission of disease ; scale insects and fruit trees and methods for their control ; insect pests and maize ; enemies of the potato, insect and fungus ; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation ; the measurement of water in connection with irrigation ; canal irrigation ; storage reservoirs ; hints on the selection of sites and on the design of earthen and other dams ; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

DISTRIBUTION OF WINTER CEREALS.

The undermentioned winter cereal seeds will be available for free distribution; free on rail Salisbury, under the usual terms of Co-operative Experiments, during the months of March, April and May.

Not more than four or five kinds can be issued to each applicant, and the weight of the seed of each kind will be from 15 to 20 lbs. The successful results which have already been obtained with winter cereals when sown on naturally moist soil without irrigation, justify the hope that any of those below mentioned are likely to prove satisfactory and are certainly well worth trial under such conditions.

Those marked with an asterisk are thought to be specially suited to non-irrigated land.

WHEAT.

Bobs.

Klein koren.

Du Toit's koren.

*Early Gluyas.—Very early.

*Golden Ball.

*Medeah.

OATS.

Algerian.

*New Zealand. (A late kind, giving a stout feeding oat.

*White Tatarian.

*Sidonian.

BARLEY.

*Nepal barley wheat.

*Chevalier malting barley.

RYE.

*Early Rye.

*Mammoth late winter. Under certain conditions, this variety if sown early, can be fed off by stock in mid-winter and allowed to run into ear in early spring.

Applications should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, and should be accompanied by full particulars as to the method of forwarding which is desired.

In the case of consignments to be sent by Parcel Post or addressed to a siding, on which charges must be prepaid the applicant should enclose cheque or post office order to defray such expenses.

TOBACCO SEED.

All enquiries for tobacco seed should be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones, grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Fencing Loans Committee, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Committee, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Loans Committee to the Director of Agriculture, Salisbury.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may obtain pure bred stock for breeding purposes through the Department of Agriculture.

The stock is selected in South Africa by a competent official buyer and payments up to a total value of £75 may be made by instalments spread over one year, a deposit being made in the first instance, one third of the purchase price on delivery, one third after six months and the balance a year after purchase. The Government meet risks in transit and until delivery is effected. For larger amounts cash payments are required.

Purchasers of single or a few animals require to wait until truck-loads can be made up in order to reduce the charges for railage. Recent purchases have included cattle of several

breeds, rams and ewes and pigs. Applications for high class stock only will be considered.

Special arrangements have been made for the purchase of stock in England or Europe.

Fuller particulars may be obtained on application to the Director of Agriculture, Salisbury.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an officer deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars, together with plans and specifications, can be obtained.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.

Winter Feeding of Farm Stock, by H. Godfrey Mundy, F.L.S.

Ensilage, by H. Godfrey Mundy, F.L.S.

The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.

Rhodesian Standard Types of Maize and their points, by H. Godfrey Mundy, F.L.S.

Requirements in sending Botanical Specimens to the Department for Identification.

The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc.

Agricultural Co-operation in Rhodesia, by P. J. Hannon.

Plans and Specifications of Flue Curing Barns.

Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.

Hints on Irrigation—Small Gravitation Schemes—by W. Martin Watt, Government Agricultural Engineer.

Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., Government Agricultural Chemist.

Instruction in Dairying, by Miss E. A. Maidment.

Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.

Winter Cereals, by H. Godfrey Mundy, F.L.S.

CROPS.

How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.

Cotton Cultivation, by J. L. Stinson.

The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.

Maize Growing, by H. Godfrey Mundy, F.L.S.

Onion Growing, by H. Godfrey Mundy, F.L.S.

Tobacco, by G. M. Odum.

Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S. |

Notes on Tobacco Culture:

Bulletin No. 5;

Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.

Flax-Linum Usitatissimum, by C. E. F. Allen.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

Onion Thrips, by R. W. Jack, F.E.S.

"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.

- The Potato Tuber Moth, by Rupert W. Jack, F.E.S.
The Tsetse Fly, by L. E. W. Bevan, M.R.C.V.S.
Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.
The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.
The Head Smut of Maize, by H. Godfrey Mundy, F.E.S.
Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.
Black Orange Aphis, by Rupert W. Jack, F.E.S.
Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.
Regulations affecting the Importation of Potatoes, by Rupert W. Jack, F.E.S.
Selection of Spraying Outfit, by R. W. Jack, F.E.S.
Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by W. Jack, F.E.S.

VETERINARY.

- Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.
Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S., and M. F. McGregor.
African Coast Fever, by L. E. W. Bevan, M.R.C.V.S.. (revised edition).
Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.
Strangles, by F. D. Ferguson, M.R.C.V.S.
Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.
The Construction of Dipping Tanks for Cattle.
Animals Diseases Consolidation Ordinance, 1904.
Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.
Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

- Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.

Loans for Fencing.

The Time and How to Find it, by Rev. Father Goetz, S.J.

Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.

Game Law: Summary of.

Services of Agricultural Engineer.

Lectures for Farmers.

Animals Diseases Amending Ordinance, 1911.

Government Notices.

[25th April, 1911.]

PURCHASE OF BULLS BY GOVERNMENT FOR DISTRIBUTION TO FARMERS.

THE Government has arranged to purchase a limited number of Bulls in England, to be re-sold on arrival here to approved applicants in occupation of farms.

The animals are being selected from the Hereford, Sussex and milk Short-horn breeds. They will be about two years of age and old enough for service in October next. The average cost in England is expected to be £40. They will arrive in Salisbury about the end of July next, when they will be placed in charge of the Veterinary Department to tend and test. Approved applicants will be advised when the animals are ready, and will be expected to take immediate delivery.

TERMS.

The purchase price will include all expenses up to the time of delivery, price paid to original owner, commission and charges of buyer and shipper, freight (including attendance and keep on journey), expenses and keep during testing and inoculation up till time of delivery, and a departmental charge to meet administrative expenditure, but not insurance.

No farmer will be allowed to take more than one animal, and one-half of the purchase price must be paid on delivery to applicant, and the balance in six and twelve months, if the animals survive, but either of the latter instalments would be remitted should an animal die before due date. No animal to be disposed of without the written consent of the Director of Agriculture until payment is completed.

All applications should be addressed to the Director of Agriculture, and should state the breed of animal required and signify agreement to the terms and conditions as stated above.

All applications will be considered in order of priority, but the Government reserves the right to refuse, without stating the reason, the acceptance of any application.

No. 154 of 1911.]

[9th May, 1911]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance of 1904," I do hereby declare the whole of the Native district of Bulawayo to be an area actively infected with the disease known as African Coast Fever.

No. 184 of 1911.]

[25th May, 1911]

AFRICAN COAST FEVER—TRANSPORT CATTLE.

IT is hereby notified for public information that His Honour the Administrator has been pleased, in terms of section 11 of the regulations published under Government Notice No. 329 of 1910, to fix areas mentioned in the sub-joined Schedule A as places wherein the movement of cattle for draft purposes may be allowed subject to the provisions of the aforesaid Notice, section 15 whereof is republished hereunder for general information.

The provisions of the said Notice regarding transport cattle shall come into force and effect on the 1st July, 1911, and not as fixed by Government Notice No. 105 of 1911, which is hereby cancelled.

SECTION 15, GOVERNMENT NOTICE NO. 329 OF 1910.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle—

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

SCHEDULE A.

I. PLUMTREE.

An area in the Bulalima-Mangwe district lying west of the Nata and Tjankwa Rivers, from where the latter crosses the farm Tjankwa; thence along the northern boundary of the farm Burntside to the north-eastern beacon of Westfield; thence bounded by and including the following farms: Westfield, Highfield, Glencoe, Stylfontein, Sterkfontein, Kwiti, Empandeni, Klipfontein, Fixburg, Exmoor, Weltevreden, Roscommon, Jim, Castleblock, Ingwesi, Pieter's farm, Lewis's farm and Mphoeng's Extension.

2. COLDRIDGE SIDING.

An area including the farms Coldridge, Orange Grove, Rootfield and Burntside.

3. MARULA SIDING.

An area in the Bulalima-Mangwe district, bounded by the eastern boundary of the Plumtree and Coldridge areas from the junction of the Manyamyama and Tjankwa Rivers, to the south-western beacon of Lewis's farm; thence in a south-easterly and easterly direction along a demarcated line to the junction of the Bulawayo-Tuli road; thence along the latter to the Shashani River; thence up that river to the south-eastern beacon of Beaconsfield; and thence by and including the following farms: Warnaford, Shashani, Edenvale, Marshlands, Wilfred's Hope, Mananda, Manda, Sherwood and Pandis; thence down the Natane River to its junction with the Manyamyama River; thence down the latter to the point first named.

4. FIGTREE AREA.

An area bounded by a line drawn from the junction of the Natane and Manyamyama Rivers to the south-west beacon of the farm Mananza; thence by and including the following farms: Luchabi Outspan, Tunda, Bickley, Beckengham, Penge, Norwood, Ascot Estate West, Welcome, Pendennis, Honeybird-kop, Vreigevicht, La Concorde, De Hoop, Forwards; thence to a point where the Ove River crosses the southern boundary of Forwards; thence down the Ove River to where it intersects the northern boundary of the farm Ove; thence easterly along the north-western boundary of the farm Ove; thence by and including the farms Undza, Lushamgwe, Malala, Kezi and Junction; thence along the southern boundary of Mount Edgcombe to its south-western beacon; thence in a northerly direction along the eastern boundary of the Marula area to the point first named.

5. WESTACRE JUNCTION.

An area embracing the following farms:—Joe's Luck, Klipspring, Irene and Collaton.

6. BULAWAYO AREA.

An area bounded by and including the following farms:—Alnwick, Dewsbury, Millievale, Ireland, Bleu Bonny, Craiglea, Stoney Croft, Billars, Slights, Helenvale, Redbank A, Devonby, Seaborough,

Umkien, Fundisi, Imbeza Kraal, Lower Noniweni, Mani, Willsgrove, 100-acre lots, Claremont, Outspan No. 1 Tuli Road, Emangeni, Inyorka and Sauerdale.

7. HEANEY JUNCTION.

An area including the following farms:—Maxim Hill, Three Fountain, Driehoek, Maldon, Imbeza Block, Springs, Hope Valley, Duncal, Kirton and Wilsondale.

8. BEMBESI STATION.

An area bounded by the Heaney Junction and Bulawayo areas as far as the farm Kennebec; thence along the western boundaries of Kennebec, and by and including the farms Kennebec, Galeta's kraal and Umgusa block; thence along the north-eastern boundaries of Winter, Spring and Eland, to the south-western beacon of Westland Row; thence along the western boundaries of Westland Row, Bembezaan, Westgate; thence by and including Goodwood block, Goulay's block, Crescen's Syndicate block, Lavender Grange, Dromoland, Oscardale, Half-Ration Ranche, Wessels, Greenlands, Lochard Block, Rouseville, Inyozan, Fochabers Sub-division A, Kodhwayo, Zimbili and Victory.

9. INSIZA NORTH.

An area, with access to Insiza Station, comprising the following farms: Allendale, Ensangu block, Insangu reserve, Murray's farm, Frei's farm, and that part of Bulawayo Syndicate block, Mbatl Tiabetsi block lying west of the road from Frei's farm to Insiza Station.

Note.—Access is granted for ox transport from the above-described area to Insiza Station subject to the condition that oxen will not be allowed to cross the railway line.

10. INSIZA SOUTH.

An area bounded by and including the following farms:—Blackwaters, Carlssen's, Glenorchy, Glenavon, N'dumadombi, Pioneer farm, Altyre, Three Fingers Outspan, Foxdale, Heathfield, Woodstock, Idutwa, Kildare, Lancaster, York, Indina, Wessel's block, Nauhoho block, Field farm, Ungungusse, Tekwe outspan and Magoholo.

11. SHANGANI NORTH.

An area bounded by and including Ruby block Blinklip, Zenda, Gillman, Barehill, Ceylon, Clare, Hampton, Torva block, from the northern beacon of Torva block along the boundary of Thompson's farm to the Vungu River; thence down the Vungu and Shangani Rivers to the Shangani reserve; thence along the eastern boundary of the said reserve to the north-western beacon of Gourlay's block; thence along the north-eastern boundaries of Gourlay's and Crescen's Syndicate blocks to the farm Sunny Ranche; thence by and including the farms Sunny Ranche, Auckland, Manbo, Umsungwa Ranche and that portion of the Bulawayo Syndicate block, Mbatl Tiabetsi block not included in the Insiza North area, Esmyan-gene block, Pongo outspan; thence along the railway line to the eastern boundary of the East Shangani block; and thence to the south-eastern boundary of the Ruby block.

12. SHANGANI SOUTH.

An area bounded by the railway line from the western boundary of the farm Oaklands to the eastern boundary of the East Shangani block; thence by and including East Shangani block, Teakwood, Arupanga, De Beer's block, Ebley, Obocoosco, Wolfscrag, Ruins, Albany, Tsinda, Parkyn's farm and the south-western boundary of Oaklands to the railway.

13. SOMABULA SIDING.

An area bounded by and including the following farms: Dawson's farm, Four Chums, Lewis's farm, West Gwelo block, Ghako block, Brown's farm, Burn's farm, St. Patrick, Dewhurst, Fairfield, Forfar, Scrub, Woodland and Kenilworth.

14. GWELO STATION.

An area in the native district of Gwelo bounded by a line drawn from a point on the Shangani River where it enters the Shangani Reserve; thence northwards along the boundary of that reserve to the Gwelo River, and up that stream to the north-western corner of the Main Belt Block, along the northern boundary of that property to the Que Que River; thence up the Que Que River and the Long Valley Spruit to the northern boundary of the farm Long Valley; thence to the north-western beacon of that farm and along its western boundary; thence along the northern and eastern boundaries of Strathfillan, the southern boundaries of Adair and Wodehouse, the western and southern boundaries of Que Que Reserve; thence along the eastern boundaries of Lochill, Netherby, Stonefield, Kanuck, Ranjali's Ranche, Dopton, Wildebeeste Block and Safago; thence along the southern boundary of Safago and Divide, Kanuck, and the south-eastern boundary of Watershed Block, and from the most southerly beacon of Watershed Block in a direct line to the south-eastern beacon of Somabula; thence along the southern boundary of that farm, Sonambula, Meadows, Good Hope, Johnston, and along the western boundary of Johnston, Vungwana South, Vungwana North, and the south-western boundaries of Walton, Henley, Ensors, Desvages, the Vungu Block, and Thompson's farm to the Vungu River; thence down that river to its junction with the Shangani River and down that river to the starting point.

15. REDBANK.

An area bounded by and including the following farms: Thornvalley Block, Harris, Stevens, Tableland, Seale, Condene, Redbank B, Richardson's, Pell's, Badminton Block, M' nondu, Ascot Estate, Naseby N. and S., Stanhope South, M'kuse, Chesa, Luvo, and Samunya.

16. NYAMANDILOVU STATION.

An area bounded by and including the following farms: Moana, Wainoni, Loskey, Cawston Block, Umguzaan Block, Hilda's Kraal, Spring Grange, Rochester, Acutt's and Crewe's Block, Vintcent's, Alicedale, Invani, Springs, North Stanhope, Bromley, Eden, Riverbank, and from the south-western beacon of the latter in a direct line to the junction of the Tjwanka and Natane Rivers; thence down the latter to the boundary of the Gwani Reserve; thence along this boundary in an easterly direction to the south-western boundary of the Seafield Estate; thence by and including Seafield, Norfolk, Buchanan, Langvlaagte, and Matabeland Concession.

17. MALINDI STATION.

That portion of the native district of Wankies south of the Wankies area and the Inyantue River, from where the latter intersects the eastern boundary of the Wankies coal area to its junction with the Gwaai River.

18. WANKIES AREA.

An area including the Wankies coal area and that portion of the native district of Wankies west of the railway between the southern boundary of the Matetsi area and a line drawn 20 miles south of the Wankies-Deka road.

19. MATETSI SIDING.

An area bounded by a line drawn from the junction Kafuli and Matetsi Rivers to Kesi; thence to Missis Pan on the Bechuanaland border; thence along the border in a south-easterly direction to the farm Pandamatenka; thence from the south-western beacon of that farm to the south-western beacon of

Guyo, along the southern boundary of the latter to the Tshowe road; thence along the latter to the farm Tsobolisa; thence along the western, southern and eastern boundaries to the south-western beacon of Majobola; thence along the southern boundary of the latter and in a direct line to the south-western beacon of Railway Farm No. 22; thence along the western boundary of this farm to its north-western beacon; thence in a direct line to the first-named point.

20. MATOPO TERMINUS.

An area bounded on the west and north by the Marula, Figtree, Westacre Junction and Bulawayo areas, and from the farm Adams by and including Adams, Florencedale and Absent; thence from the south-eastern beacon of the latter in a direct line to the eastern beacon of Kozi; thence along the northern boundaries of Le'lavale and Wenlock Block, and along the western boundary of the latter to its southern beacon; thence along the southern boundary of Tuli River farm, the north-western boundaries of Goto and Hwatalala, to where the latter is intersected by the Mwewe River; thence by a line due west to the Shashani River.

21. SABIWA SIDING.

An area comprising the following farms: Blanket, Vubachikwe, Hotel, Hampden Place, Insindi Block, Judd's, Wenlock Block and Sheet.

22. GWANDA STATION.

An area bounded on the north by the Matobo and Sabiwa areas, to the south-eastern boundary of the latter; thence by and including the farms Exchange, Doelfontein, Deney's, Nelson's, Makunkubi, from the southern beacon of the latter along the southern boundary of Jahoonda, the western and southern boundaries of Railway Block No. 2, to the Umzingwani River; thence down the latter to the Limpopo River; thence up the latter and the Shashi and Shashani Rivers to the southern boundary of the Matobo district.

Note.—An area along the Shashi and Limpopo Rivers is, by Government Notice No. 254 of 1910, prohibited to cattle.

23. WEST NICHOLSON.

An area comprising that portion of the native district of Gwanda bounded by and including Copthall Block No. 2, Rathgar, Forest Hill, Thornwood Block, Macaulay's, Jahoonda, Railway Block No. 2 and River Block, and that portion of the native district of Belingwe lying south of the Bembesi River and west of the Myunde and Bubyte Rivers.

24. BELINGWE.

The whole of the native district of Belingwe, excluding that portion included in the West Nicholson area, and that portion included in the Selukwe area.

25. SELUKWE AREA.

An area bounded by a line drawn from the south-western beacon of the farm Lubongo to the Lundi River; thence down the latter to the Tuli-Victoria Road; thence along this road to the Tokwe River; thence up that river to the north-eastern beacon of Idada Farm No. 1; thence along the northern boundary of that farm, Selukwe Reserve, Idhwala Farm No. 1, and Muirhead; thence along the western boundary of Muirhead and the northern boundaries of Depoto and Tibilikwe; thence along the western boundary of Tibilikwe to the north-eastern beacon of Home; thence along the eastern boundary of Home, Slade's, and Lancastershire Estate to the south-eastern beacon of the latter; thence along the southern and western boundaries of Lancastershire Estate, the southern boundary of Wallclose, western boundaries of Hyrcania, Fairview, Figtree, Boulder Beacon, Ghoko Plains, Adamantia, and Dorset, and from the south-western beacon of Dorset along the southern boundaries of Dorset, Clifton, Mkatsi, along the southern boundary of Welsh Farm Block to the first-named point.

26. SURPRISE SIDING.

An area including the following farms: Wallclose, Beacon Kop, Home, Slade's, Lancastershire Estate and Engesa source.

27. INDIVA SIDING.

An area including the farms; Linsdale, Gando, Whawha Outspan, Indiva, Albany, Hashu, Highlands, Umtebekwe, Hainault, Gubuire, and Elliott.

28. LALAPANZI.

An area bounded by a line drawn from the north-eastern beacon of Linsdale along the northern boundaries of the farms Linsdale, Gando, Whawha Outspan, the western boundaries of Ingeni, Boulder, Umhlali; thence along the south-eastern boundary of the Que Que Reserve to its north-eastern beacon; thence along the southern and eastern boundaries of Ashdale, the eastern boundaries of Bunsu, Shava, and Oryx to the Sebakwe River; thence up the Sebakwe River to the north-western boundary of the Central Estates; thence following the boundary of that estate to the north-eastern beacon of Kleinfontein and along the northern and western boundaries of that farm, and along the eastern boundaries of Mansfield and Finland to the Tokwe River, down that river to a point due east of the Senangwe Hill; thence to the north-eastern beacon of the Selukwe Reserve and along the northern boundary of that reserve to the south-eastern beacon of Elliott; thence along the eastern boundaries of Elliott, Hainault, and Guburie, and the southern boundaries of Partridge and Wojele and the western boundary of the latter farm to the point first named.

29. IRON MINE HILL SIDING.

An area including:—

- (a) The native districts of Victoria and Ndanga.
- (b) That portion of the native district of Gutu lying to the south of the Divuli River to where it crosses the northern boundary of the Gutu Reserve.
- (c) That portion of the Chilimanzi native district lying east of the Ngesi River and South of a line running along the north side of the Iron Mine Hill-Victoria Road as far as the Shashi River; thence down the Shashi River to the north-western corner of Liberty; thence following the eastern boundary of the Chilimanzi district to the south-western beacon of Merlin; thence along the southern boundaries of Merlin and Gowrie to the Umtilikwe River; thence direct to Gongwe Hill, and along the northern boundary of the Gutu Reserve to the Divuli River.
- (d) The native district of Chibi, excluding that portion (1) lying to the south and west of the Nuanatisi River, and (2) that portion north-west of the old Tuli-Victoria road.
- (e) That portion of the Gwelo district comprising portion of the farms Upland and Iron Mine Hill and the farm Kleinfontein.
- (f) The Iron Mine Hill road from the Ngesi River to Iron Mine Hill farm.

Note.—Access to Iron Mine Hill Station from the southern portion of this area involves passing through a portion of the Umvuma area.

30. UMVUMA SIDING.

An area enclosed by a line drawn from the confluence of the Sabi and Divuli Rivers, up the former to the south-east beacon of Sabi Oog, thence thence northwards along the eastern boundaries of Sabi Oog, Sunnyside and Penhoe, and the northern boundaries of Penhoe, Bucknall, Glynn and Erdington Estate; thence along the western boundaries of Erdington Estate and

Morrell to the south-eastern beacon of Mexico; thence along the southern boundaries of Mexico, Umtegeza, eastern boundary of Albany, and southern boundaries of Phillipsdale and Christiana to the Ngesi River, and down that river to the Mashaba Hills; thence southwards to Umniati beacon on the Umniati River; thence direct to the north-western beacon of Welgevonden, and along the western boundaries of that farm, Vrede, Bergplaats and Bergendale to the Sebakwe River; thence up that river to where the boundary of the Central Estates crosses it; thence along the north-western and south-western boundaries of that estate to a point where it is crossed by the Iron Mine Hill-Victoria road; thence along the north side of that road to the Shashi River; thence down that river to the south-western beacon of Gurajena Reserve; thence following the eastern boundary of the Chilimanzi district to the south-western beacon of Merlin; thence along the southern boundaries of Merlin and Gowrie to the Umtilikwe River; thence direct to Gongwe Hill and along the northern boundary of the Gutu Reserve to the Divuli River, and down that river to the first-named point.

31. HUNTER'S ROAD SIDING.

An area in the native district of Gwelo bounded by a line drawn from the south-western beacon of Adair, along the western boundaries of that farm and Barkly and the southern boundary of Boschklouf, and along the western and northern boundaries of Long Valley to the Long Valley Spruit, and down that stream to its confluence with the Que Que River; thence up that river to the north-western corner of Watermael, along the northern and eastern boundaries of that farm and the eastern boundaries of Shawlands, Loads, Sunbury, Dwaalvlaakte and Wodehouse; thence along the southern boundaries of Wodehouse and Adair to the first-named point.

32. QUE QUE STATION.

An area in the native district of Gwelo bounded by a line drawn from the north-east corner of Oryx, down to the Sebakwe and Umniati and Sinyati Rivers, to the junction with the Zambesi; up that river to its junction with the Sengwe, and up that river to its junction with the Lutopi River; thence in a straight line to the junction of the Shangani and Gwelo Rivers, and up the latter to the north-west corner of the Main Belt block; thence along the northern boundary of that block to the Que Que River, up that river to the most westerly corner of Watermael, along the northern and eastern boundaries of that farm, Shawlands, Loads, Sunbury, Dwaalvlaakte, Wodehouse, Ermelo, Umsungwe block to the most southern beacon of the Que Que reserve; thence along the south-eastern boundary of Que Que reserve to its north-eastern beacon; thence along the southern boundary of Ashdale; thence along the eastern boundaries of Ashdale, Bunsa, Shava, Oryx, to the starting point.

33. BATTLEFIELDS STATION.

An area in the native districts of Hartley and Charter, bounded by a line drawn from the junction of the Sessombi and Umniati Rivers, up the latter to the Mashaba Hills; thence northwards along that range to the Bumbi beacon thereon; thence in a straight line in a westerly direction to the beacon on Elephant Hill; thence in a straight line to Mile 1,545 on the railway; and thence to the point first named.

34. UMSWESWE STATION.

An area in the native districts of Hartley and Charter, bounded by a line drawn from the junction of the Umniati and Umsweswe Rivers, up the former to the Mashaba Hills; thence southwards along that range to the Bumbi beacon thereon; thence in a straight line in a westerly direction to the beacon on Elephant Hill; thence in a straight line to Mile 1,545 on the railway; thence in a straight line to the junction of the Umniati with the Sessombi River; thence down the Umniati River to the starting point.

35. HARTLEY AND GATOOMA.

An area in the native district of Hartley, bounded by a line drawn from the confluence of the Umfuli and Umniati Rivers; up the latter to its junction with the Umsweswe; thence up the latter to the Mashaba Hills; thence southwards along that range to the Bumbi beacon; thence in a straight line southwards to the Ngesi River; thence up that river to the eastern boundary of the Mondoro reserve; thence in a north-easterly direction along the western boundary of the same to the Doranango River; thence down this river to the Umfuli; and thence down the Umfuli to the point first named.

36. GADZEMA STATION.

An area in the native district of Hartley, bounded by a line drawn from the confluence of the Umsengaisi and Umfuli Rivers, up the latter to the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to the boundary of the native district of Lomagundi at a point where the Hunyani River enters it at the Hunyani poort; thence westwards along this boundary line to the point first named.

37. MAKWIRO STATION.

An area in the native district of Hartley, bounded by a line drawn from a point on the Umfuli River at the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to the boundary of the native district of Lomagundi at a point where the Hunyani River enters it at the Hunyani poort; thence up the Hunyani River to the western boundary of the Hunyani Estate; thence along the western and southern boundaries of that estate to the north-western beacon of Railway Farm No. 29; thence along the western boundary of that farm and the eastern boundary of Railway Farm No. 28, Makwiro Source and Ardmere; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and down that river to the first-named point.

38. NORTON SIDING.

An area in the native district of Hartley, bounded by a line drawn from the junction of the Gwibi and Hunyani Rivers, along the eastern boundary of Hunyani Estate; thence along the northern and western boundaries of Railway Farm No. 29 and the eastern boundaries of Railway Farm No. 28, Makwiro Source and Ardmere; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River, and up that river to its junction with the Doranango; thence up this river to the western boundary of the Mondoro Reserve, and along the boundary of this reserve to the Ngesi River; thence up this river to the south-western beacon of the farm Christiana, and along the southern boundaries of that farm, Phillipsdale, Albany, Umtegeza, Ngesi, Mexico; thence along the eastern boundaries of the latter and Revelant to its northern beacon; thence northwards along the boundary of the Hartley native district to the point first-named.

39. HUNYANI TANK.

An area including the following farms:—Lowlands, Gordonias, Aberdeen, Rietbuck Outspan, Herren Hansen, Saffron Waldron, Riverside, Lyndhurst, Kilworth, Porta Outspan and Clement's Plot.

40. 1645 $\frac{1}{2}$ -PEG, B. AND M. AND R. RAILWAYS.

An area in the native district of Goromonzi, including the farms Warwickshire, Sublime, United, Stonehurst, Somerby, Spitzkop, Doornfontein, Sunny-side and Lilfordia.

41. SALISBURY A.

An area, with access to Salisbury, comprising the following farms:—Ingleborough, Lowdale, Eskband, Calgary, Oldbury, Komani, Thornpark, Thetford and St. Gerera.

42. SALISBURY B.

An area comprising the following farms:—White Cliff, Parkridge, western half of Fontainbleu, Heany, Oatlands, Amalinda, Ingwe, Willowvale, The Rest, Langford and Saturday Retreat.

43. SALISBURY C.

An area, with access to Salisbury, bounded by and including the following farms:—Henricksen, Bluff Hill, Tynwald, eastern half of Fontainbleu, Lochinvar, Makabusi Outspan, Hopley, Odar Outspan, Longlands, St. Mary's, Idlesleigh Extensions, Harveydales, Twentydales, Glenwood, Adelaide, Ventersburg, Epworth, Hatfield, Prospect, Waterfall, Warren and Mabelreign.

44. SALISBURY D.

An area, with access to Salisbury, bound by and including the following farms:—Pote, Balkize, Willesdon, Sussexdale, Welston, Teviotdale, Pomona, Rietfontein, The Nursery, Greendale, Reserve, Donnybrook, Dispute, Sebastapol, Caledonia, Father Hartmann's Farm, Chishawasha, Stuhm, The Springs, The Grove, Umritsur, Borrowdale Estate, Thelksindi, and the Chindamora Reserve.

45. ARCTURUS,

An area in the native district of Goromonzi consisting of the following farms:—The Craig, Kilmuir, The Meadows, Mount Shannon, Halstead, Bally Vaughan, Saratoga, Marsala, Frascati, Strathlorne, Ivordale, Devonla, Rudolphia, Thornvlei, Alderley, Learig, Gilnockie, Gardiner, Mabfen, Retreat, Guernsey, Grazeley, Lonely Park, Chinyika, Orion, Reserve, Colga, Oribi, Ivanhoe, and the Chikwaka and Msana Reserves.

46. BROMLEY SIDING.

An area bounded by and including the following: Kunzwi Reserve, farms Kinahan, Rochester, Belvedere, Bellevue, Belmont, Ruwa, Bain's Hope, James, The Glebe, Galway Estate, Deanesbrook, Nalira Reserve, Buenavista, Seki Reserve, Shiota Reserve, Great Bromley Estate, and Weardale.

47. MARANDELLAS (NORTH).

An area including the following farms: Musi, Peddie, Southampton, Roraima, Essexvale, Rockery, Progress, that portion of Lendy north of the railway line, Longlands, Shortlands, Loquat Grove, Helm, Cotter, Rapid, Revolt, Rokodzi, Springvale, Retreat, Pirate, Bovey Tracey, March, Rocklands, Forest Range, Cornwall, Somerset, Dorset, Buckingham, Sunny Fountains, Mangwendi Mission, Tiller, Rapture, Warwick, Cambridge, Nandu, Argosy, Rapture, Dormervale, Oxford, Norfolk, Surrey, Sussex, Suffolk, Kent, Middlesex.

Note.—Access will be granted for ox transport from the above described area on to Uplands, subject to the condition that no such wagons be outspanned on the south side of the railway.

48. MARANDELLAS (SOUTH).

An area bounded by a line drawn from the most northerly beacon of Gatz, along the western boundaries of that farm and Nolans, and the southern boundaries of Retreat, Springvale, Rakodzi, Longlands, and from the southernmost beacon of that farm along its western boundary to the railway; thence westwards along the railway to where it enters Peddie; thence along the eastern and south-western boundaries of Musi and the western boundaries of Hedon, Stow, Nungubi Mission, Rhodesdale, Poltimore, Endsleigh, Chudleigh, Bickleigh Saltash, and Balmoral, and from the south-west of Balmoral along the western boundaries of Corfe, Vergenoeg, and Good Hope to the Sabi River; and thence along the south-eastern and eastern boundaries of the native district of Marandellas to the farm Tweedjan; thence along the eastern boundaries of Tweedjan, Nyakurwi, Elandslaagte, Summerslust, Delta, Soshwi Reserve, De-ay, Boom, Ta-ra-ra, Nolands, and Gatz to the point first-named.

Note.—Access will be permitted for draught oxen from the ox transport area immediately to the north of that herein described on to Uplands, provided such wagons are outspanned only to the north of the railway.

49. MACHEKE STATION.

An area including (1) the native district of Mtoko; (2) the native district of Mrewa, excluding Argosy and Rapture; (3) that portion of the native districts of Marandellas and Makoni bounded by a line drawn from the north-western beacon of Showers, along the western boundaries of Showers, Gongwe, Magar, northern and western boundaries of Highlands, north-western and south-western boundaries of Allen, western boundary of Holton Estate, western and southern boundaries of Belmont Outspan, north-western boundary of White Gombola, western boundaries of Bonn, Calne, Wilton, western and southern boundaries of The Cave, and the Southern boundary of Mere; thence up the Macheke River to the south-western beacon of the Monte Cassino; thence along the southern and eastern boundaries of Monte Cassino to its most northern beacon; thence in a direct line to the south-western beacon of Changwe Rancho No. 1; thence along the southern and eastern boundaries of Changwe Rancho No. 1 and the north eastern boundary of Changwe Rancho No. 2 to the Mafuri River; thence along the boundary of the Mrewa district to the starting point.

50. HEADLANDS STATION.

An area bounded by the Umfuri River from where it intersects the north-eastern boundary of Changwe Rancho No. 2, down the Umfuri to the western boundary of the Inyanga district; thence in a southerly direction along the boundary of the latter district to the north-eastern corner of Rathcline; thence along the northern boundary of Rathcline, and the northern and western boundaries of the Inyati Block to the south-eastern beacon of Trelawny; thence along the southern boundary of Trelawny; thence in a direct line to the north-east beacon of Nyamangura and along the eastern boundaries of that farm and Maringowe; thence in a direct line to the north-eastern beacon of Lone Kop; thence southwards and westwards along the boundaries so as to include the farms Lone Kop, Moodie's Vale, Emerald, Netzewa, Leeuwpoort, Lesbury and The Willows; thence up the Macheke River to the southern beacon of Monte Cassino; thence along the southern and eastern boundaries of that farm and from its most northern beacon in a direct line to the south-western beacon of Changwe Rancho No. 1; thence along the southern boundary of Changwe Rancho No. 1 to the eastern boundaries of Changwe Ranches No. 1 and 2 to the first-named point.

51. JUNCTION (MAZOE AND LOMAGUNDI RAILWAYS).

An area comprising the following farms:—St. Marnock's, Kinvarra, Haydon, Good Hope, Stamford, Gillingham, Rainham, Outspan, Homefield, Stapleford, Glenlussa.

52. 23-MILE PEG (LOMAGUNDI RAILWAY).

An area including the following farms:—Derry, Penrose, Killimore, Inkomo, Dryham, Syston, The Lily, Ballineety, Bitton, Doynton, Yate, Sandringham, Sandown, Nauweplaats, Outspan, Mboi Leegte, Jackal's Loop, Sandhurst, Warley, Umvukwe Oog, Oakwoods, Goede Hoop, Oudekraal, Kleinkopjes, Leeuws Rust, that portion of the Barwick Estate within the native district of Mazoe.

53. PASSAFORD STATION.

An area in the native district of Mazoe consisting of the farms Umsasa, Mbebi, Springvale, Passaford, Estes Park, Spa, Fairview, Weltevreden and Mackay.

54. 35-MILE PEG (LOMAGUNDI RAILWAY).

An area in the native districts of Lomagundi, Mazoe and Goromonzi, including the following farms:—Cardiff, Wellesley, Sodbury, Kingswood i Greenside, Oldlands, Pucklehills, Little England, and the Gwibi Reserve.

55. GWIBI TANK HALT.

An area including the following farms:—Darwendale, Hunyani Estate, Gwibi Junction, Eclipse Block, Downend, Charfield, and Fish Ponds.

56. BANKET, LOMAGUNDI.

An area embracing that portion of the Lomagundi district lying to the south and east of a line drawn from the north-eastern corner of the Umvukwe Ranche along the north and west boundaries of that property; thence to the north-western corner of Nzashoa, along its western boundary to the most westerly beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; thence to the 75-mile peg on the Banket-Ayrshire Railway; thence westwards to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westwards to the Hunyani River, and up that river to the boundary of the Lomagundi and Hartley districts, and excluding the farms Pucklehills, Oldlands, Greenside, Darwendale and Hunyani Estate.

57. ELDORADO, LOMAGUNDI.

An area embracing the whole native district of Lomagundi with the exception of that part bounded by a line drawn from the north-eastern corner of Umvukwe Ranche along the north-western boundary of that property; thence to the north-western corner of Nzashoa along its western boundary, and to the western beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; to 75-mile peg on the Banket-Ayrshire Railway; thence westwards to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westward to the Hunyani River and up that river to the boundary of the Lomagundi and Hartley districts.

58. SELBY SIDING.

An area comprising the following farms: Madzugetu, Mount Hampden Reserve, Mount Hampden, Bendauch, Glengara, Mgutu, Mayfield, Patterson, Selby, Pearson Settlement, Sigaro, Nalire.

59. MAZOE.

An area including that portion of the native district of Mazoe lying north of a line drawn from the south-western beacon of Moore's Grant along the southern boundaries of that estate; thence along the western and southern boundaries of the Howick Estate and Burley Bottom to the north-western beacon of Belford Estate No. 2; thence along the western and southern

boundaries of Belford Estate to the westernmost beacon of Springvale; thence along the north-western boundary of Springvale, the western, northern and eastern boundaries of Msasa, the eastern boundaries of Mabebi and Springvale to the western boundary of Great B; thence along the western, southern and eastern boundaries of Great B to the southernmost beacon of Arnold's; thence in a line east to the western beacon of Pote; thence along the northern boundary of that farm to the Poorte River, down the Poorte River to the south-western beacon of Glen Divis, along the western boundaries of that farm, Wolf Hill and Rocky Spruit; thence along the northern boundary of Rocky Spruit to its north-eastern beacon; thence following the western, boundaries of the farms Geluk, Simoona Reserve, Ireniedale, Dunmaglas Duntarvie and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession, following the eastern, northern and western boundaries of the Mazoe district to the first-mentioned point.

60. KIMBERLEY REEFS

An area described by a line drawn from the south-western corner of Glen Divis, along the western boundaries of that farm, Wolf Hill and Rocky Spruit; thence along the northern boundary of Rocky Spruit to its north-eastern beacon; thence following the western boundaries of the farms Geluk, Simoona Reserve, Ireniedale, Dunmaglas, Duntarvie and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession; thence following round the western, northern and eastern boundaries of the native district of Darwin to the junction of the Umfurudzi and Mazoe Rivers, up the Mazoe River to the junction of the Inyagui; thence up the latter to the eastern beacon of the Msana Reserve; thence along the northern boundary of that reserve to Mount Murgive Masimbi; thence along the southern boundaries of the farms Nabgwe, Ceres, Woodlands, Hereford and The Vale; thence in a northerly direction from the south-western beacon of The Vale to the north-western beacon of Bonny, following up the course of the Poorte River to the first-mentioned point, *i.e.*, the south-western beacon of Glen Divis.

AFRICAN COAST FEVER.

[25th May, 1911.

ATTENTION is drawn to Government Notice No. 184 of 1911 defining certain areas wherein movement of cattle for draught purposes may be allowed subject to the provisions of Government Notice No. 329 of 1910.

Under Government Notices Nos. 14, 106, and 154 of 1911 certain portions of the country have been declared to be actively infected with African Coast Fever, where all movement of cattle is still prohibited.

The areas mentioned in the subjoined list include portions of infected veld, and no movement of cattle for draught purposes will be permitted within these until further notice.

- No. 4. Figtree Area.
- „ 5. Westacre Area.
- „ 6. Bulawayo Area.
- „ 7. Heaney Junction Area.
- „ 8. Bembesi Area.
- „ 10. Insiza South Area.
- „ 20. Matopo Terminus Area.
- „ 40. 16½-Mile Peg Area.
- „ 41. Salisbury A Area.
- „ 42. Salisbury B Area.

- No. 43. Salisbury C Area.
 „ 44. Salisbury D Area.
 „ 47. Marandellas North Area.
 „ 48. Marandellas South Area.
 „ 50. Headlands Area.
 „ 51. Junction Mazoe & Lomagundi Railway Area.
 „ 52. 23-Mile Peg Lomagundi Railway Area.
 „ 53. Passaford Area,

F. J. CLARKE,
 For the Director of Agriculture.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in Gwelo native district, as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I. of the Fencing Ordinance of 1904 to the undermentioned area:—

From the Shangani River on the Bulawayo-Salisbury road, along this road to its intersection with the Gwelo commonage boundary; thence following the south-western, south-eastern and eastern boundaries of the commonage till the Bulawayo-Calisbury road is again reached; thence along this road to its intersection with the south-western boundary of the Central Estates; thence in a north-westerly direction along the south-western boundary to the most western beacon of the said estates; thence along the north-western boundary of the estates to where it crosses the Sebakwe River; thence along this river to Hartley Hill road; thence along this road to the Umniati River; thence along this river to its junction with the Ngadoni River; thence along a line drawn to the north-east corner of the Shangani Native Reserve; thence along the eastern boundary of this reserve to where it is crossed by the Shangani River; thence along this river to the Shangani Drift on the Bulawayo-Salisbury road.*

Dated at Gwelo, this 4th day of April, 1911.

For self and co-petitioners,
 H. R. CUMMING.

No. 85 of 1911.]

[16th March, 1911.

IT is hereby notified for public information that the subjoined Ordinances, entitled

“Additional Appropriation 1910-11 Ordinance, 1911,”

“Animals Diseases Amendment Ordinance, 1911,” have been assented to by His Excellency the High Commissioner, and are hereby published in terms of the 36th section of the Southern Rhodesia Order in Council, 1898.”

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the “Animals Diseases Consolidated Ordinance, 1904” (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.
 - (2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.
 - (3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa.
 - (4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.
 - (5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.
5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.
6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.
7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.
8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase,

pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.
- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The

proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animals Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No. 295 of 1908.]

[1st October, 1908.]

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the Island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati

Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

- (1) Plumtree shall be regarded as the port of entry.
- (2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.
- (3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that

animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary

stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the common-age beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at in the
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to * Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

.....
Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1938.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—
- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
 - (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,
 residing on the farm
 in do solemnly and sincerely
 declare that the (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
 Station (i.e., station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls..... Heifers.....
Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent
.....

And I make this solemn declaration conscientiously believing the same to be true.
.....

Declared to at.....on this.....
day of.....before me,

Resident Magistrate for the district of
.....

No. 60 of 1911.]

[23rd February, 1911.

IMPORTATION OF SHEEP AND GOATS FROM THE CAPE OF GOOD HOPE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section I of the Regulations published under Government Notice No. 295 of 1908 by the insertion of the words "or Examiner of Stock" immediately after the word "officer" where it occurs in the said section.

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1939

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 136 and 228 of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck and Wildebeest.

- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 391 of 1908]

[17th December, 1908]

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next

in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909]

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-

rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. „ „ bulls „	0	5	0
d. „ „ donkeys „	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive

in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil., is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1905 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue

of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass

Straw

Hay

Lucerne Hay

Forage

Green Lucerne

Sugar Cane

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
- [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.
- Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
 5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
 6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....
 Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....

Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to

import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 229 of 1910]

AFRICAN COAST FEVER.

[17th August, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

IMPORTATION OF ANIMALS.

[18th August, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.]

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section I of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramaquabane Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-MacLoutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 240 of 1910.]

[1st September, 1910.]

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederae*)
- The Circular Purple Scale (*C. aonidum*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beckii*)
- The Long Scale (*L. gloverii*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 329 of 1910.]

[15th December, 1910.]

AFRICAN COAST FEVER.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

I. Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw

Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof.

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued:—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;
- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9. From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farms jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railway line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle--

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....
Bulls.....
Oxen.....
Young Stock.....
Calves.....
Cause of decrease.....
Cause of increase.....
Name of farm.....

(Owner's Signature.)

No. 33 of 1911.]

[2nd February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in accordance with section 16 of Government Notice No. 329 of 1910, declare the following areas to be actively infected with the disease known as African Coast Fever:—

Farm Hayden.	Goromouzi district.
Farm Tilbury,	Melsetter district.
Farm Aberfoyle,	Selukwe district.
Farm Brooklands,	
Farm Riversdale,	

No. 59 of 1911.]

[23rd February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in accordance with section 16 of the Regulations published under Government Notice No. 329 of 1910, I do hereby declare the whole of the native district of Matobo to be an area actively infected with the disease known as African Coast Fever.

No. 34 of 1911.]

[7th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 16 of Government Notice No. 329 of 1910, by the addition of the following clause:

"Provided, however, that cattle intended for slaughter purposes may be removed to a centre of consumption under the conditions of section 6 hereof, and under such other conditions as may be prescribed by the Chief Inspector of Stock."

No. 14 of 1911.]

[12th January, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 163, 231 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

I. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

(b) The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—
Bitton, Syston.

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

- (d) The native district of Inyanga.
 (e) The native district of Makoni.
 (f) The native district of Umzingwani.
 (g) The following farms in the native district of Insiza :—
- | | | | |
|-------------|----------------|------------|-------------|
| Centrebank, | York, | Kildare, | Lincoln, |
| Woodhouse, | Kogha, | Eldorado, | Bonnybrook, |
| Fairview, | Outspan No. 3, | Lancaster, | Blagdon, |
| Idutwa, | | | |

2. The following area is defined for the purposes of section 17 of the said Notice, viz. :—That portion of the native district of Goromonzi lying west of and including the following farms :—

Borrowdale, Springs, Stuhl, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruua River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information :—

" 16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

" 17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every pers on within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule "A" being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following :—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imbeza Plots.

Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

Special Railway Rates

FOR THE

Benefit of the Farming Community.

(Compiled.)

RATES FOR FARM HANDS.

The Board of the Rhodesia Railways have agreed to grant a special fare of $\frac{3}{4}$ d. per head per mile for the conveyance, 3rd class, of trained native farm hands from Vryburg to stations in Southern Rhodesia when in batches of not less than six and upon production of a certificate signed by a Civil Commissioner of the district in which the farmer resides, or by the Director of Agriculture.

RATES FOR AGRICULTURAL MACHINERY, PRODUCE, ETC.

When Carried at Owner's Risk.

NOTE.—Unless otherwise specified, these rates are subject to the usual smalls charges as a minimum; a smaller consignment than the minimum stipulated is carried at the ordinary rate, unless the resulting charge amounts to more than that for the minimum quantity at the special rate, in which case the latter will apply. Charges are reckoned at full rates, and the rebate applicable to each item deducted from the gross charge, the net freight only being invoiced.

ARTICLE.	FROM	TO	LINE ON WHICH APPLICABLE.	SPECIAL RATE.
1. Agricultural implements & appliances	Any Station	Any Station	All Lines	Half 3rd Class
2. Agricultural Produce of Rhodesia and Mozambique Comp'y's Territory as follows: (a) Grain of all kinds, Ground Nuts and Beans	Any Station on B.&M.R. & R.R. (Lomagundi Branch excepted)	Any Station on Buloy-Vryburg Line south of Francistown	...	¼d. per ton per mile, plus ⅓d. per ton terminals, subject to a minimum rate of 12/- per ton. Station to Station minimum 15 tons
Do.	Do.	Beira	...	¼d. per ton per mile, plus 2/6 per ton terminals. Station to Station minimum 15 tons
(b) Maize and Kaffir Grain	Any Station	Any Station	Beira-Salisbury Line and †Lomagundi Branch	One-fourth 3rd class 'Inwards' rate. Minimum 5 tons
Do.	Do.	Do.	Salisbury-Broken Hill Lines, including West Nicholson & Selukwe Branches	1d. per ton per mile. Station to Station minimum 5 tons
Do.	Do.	Do.	Blinkwater Branch	1½d. per ton per mile. Station to Station minimum 5 tons
(c) Barley Beans, Ground Nuts, Kaffir Grain, Maize, Meal, Oats, Wheat, Onions, Potatoes, Chaff, Fodder, Forage, Hay, Lucerne, Oat-hay	Do.	Do.	Gwelo-Broken Hill Lines, including West Nicholson and Selukwe Branches	Fourth-class rate, Station to Station, minimum subject to "B" Smalls
Do.	Do.	Do.	Beira - Gwelo Line, includ'g †Lomagundi Branch	Half 3rd Class 'Inwards' rate Station to Station, subject to "B" Smalls.
Do.	Do.	Do.	Blinkwater Branch	2d. per ton per mile, Station to Station, subject to "B" Small, plus 50%
Do.	Do.	Do.	Broken Hill-Sakania Line	3d. per ton per mile, Station to Station, minimum 5 tons

† Grain, Flour and Meal, transhipped from broad to narrow gauge trucks (Lomagundi Branch) and *vice versa* is subject to an extra charge of 1d. per bag, but no charge is made unless it amounts to 6d.

ARTICLE.	FROM.	TO.	RATE.
3. Bags or sacks to be used for carrying grain	Any Station ...	Any Station ...	Third Class Rate, less 33½ per cent.
Do.	Cape Town ...	Bulawayo ...	6s. 10d. per 100 lbs.
Do.	Port Elizabeth ...	Do.	6s. 0d. per 100 lbs.
Do.	East London ...	Do.	6s. 3d. per 100 lbs.
4. Cotton Seed	Any Station ...	Any Station ...	Half Third Class 'Inwards' Rate
5. Cotton in bales for export pressed 120 cubic feet or less to ton	Do.	Beira ...	1d. per ton per mile. Minimum 5 tons
6. Dipping tanks & material, including cement for construction of tanks when so certified by the Director of Land Settlement	Any Station ... (Beira to Gwelo Line and Lomagundi Branch only.)	Any Station ...	Half Third Class 'Inwards' Rate
7. Fencing material (i.e. Fencing Wire, Plain Barbed or Netting, Wooden Fencing Poles, Standards, Drop-pers, Struts, Strainers, Staples, Fencing Hurdles, Straining Posts, and Fittings, Fencing Gates, plain or common, for use in connection with Farm Fencing	Any Station on B. & M.R. & R.R.	Any Station on B. & M.R. & R.R.	Half Third Class 'Inwards' Rate. Minimum 1 ton.
8. Firewood in full truck loads; carriage calculated on the 3-4ths registered carrying capacity of the trucks	Stations on Gwelo-Broken Hill Lines and Branches	Stations on Gwelo-Broken Hill Lines and Branches	1 to 200 miles 1d. per ton per mile, and ½d. per ton per mile for the remaining distance. S. to S. Plus 1s. per ton terminal.
9. Irrigation Plant and Machinery, such as Hand and Air Pumps, Tubes for lining Wells, etc., Windmills, to be used for Irrigation purposes, and so certified.	Any Station on B. & M.R. & R.R.	Any Station on B. & M.R. & R.R.	Half Third Class Rate, on production of a certificate from the Director of Land Settlement.
10. Jute and Similar Fibres	Any Station	Beira ...	1d. per ton per mile.
11. Manures and Fertilisers	Do. (Beira to Gwelo Line and Lomagundi Branch only.)	Any Station ...	Half Fourth Class Inwards Rate. Station to Station. Minimum 1 ton.
Do.	Any Station Beira - Gwelo Line	Stations beyond Gwelo	Half rates to Gwelo as above, plus ordinary rates onwards. Minimum 1 ton.

To secure the reduced rates applicable to agricultural produce, consignor is required to furnish a certificate on the form provided by the Railways for the purpose declaring the district in which the produce was grown

ARTICLE.	FROM.	TO.	RATE.
Do.	Beira ...	Bulawayo ...	£4 16s. 7d. per ton Station to Station Minimum 1 ton.
Do., imported in lots of not less than 1 ton or pay- ing thereof	Cape Town ...	Do.	5s. 9d. per 100 lbs.
Do.	Port Elizabeth..	Do.	5s. 1d. "
Do.	East London ...	Do.	5s. 3d. "
12. Potatoes (im- ported for <i>bona</i> <i>fide</i> planting pur- poses)	Any Station on B. & M.R. & R.R.	Any Station on B. & M.R. & R.R.	Half Third Class 'In- wards' Rate.
Potatoes (imported for <i>bona fide</i> plant- ing purposes)	Cape Town ...	Bulawayo ...	7s. 2d. per 100 lbs.
Do.	Port Elizabeth..	Do.	6s. 4d. "
Do.	East London ...	Do.	6s. 7d. "
13. Timber (Red- wood) for export	Forest Stations (Southern Rhod- esia)	Vryburg or Beira	½d per ton per mile, full truck loads. S. to S.
14. Tobacco (Rhod- esian grown)	Do.	Any R.R. Sta- tion south of Francistown	¼d. per ton per mile, plus 1s. 8d. per ton terminals, subject to a minimum rate of 12/- per ton. Mini- mum 5 tons.
Do.	Do.	Do.	¼d. per ton per mile, plus 1s. 8d. per ton terminals. Minimum 2 tons.
Do.	Do.	Do.	1d. per ton per mile subject to usual 'smalls' minimum.
Do.	Do.	Beira	¼d. per ton per mile, plus 2s. 6d per ton terminals. Minimum 5 tons.
Do.	Any Station ...	Any Station ...	Same as Agricultural Produce Rates No. 2, Section C, subject to ordinary 'Smalls' minimum.
Do.	Do.	Salisbury or Bulawayo	When consigned to the Tobacco Warehouse, for curing purposes, ¼d. per ton per mile. Minimum charge 1s. per consignment-
Do.	Salisbury or Bulawayo	Any local Sta- tion	When consigned from the Tobacco Ware- house, cured and bal- ed, ¼d. per ton per mile. Minimum charge 1s. 0d. per consignment.
Do.	Salisbury ...	Bulawayo in local or thro' traffic	Do. do.
15. Vegetables (Mar- ket Garden Pro- duce)	Consigned to	Stations south of Vryburg.	½d. per ton per mile over the Rhodesian Railways throughout to Vryburg, plus ter- minals, at the rate of 1s. 8d. per ton,

LIST OF AGRICULTURAL IMPLEMENTS AND APPLIANCES

Carried at *Half* Third Class "Inwards" Rates over Rhodesia
Railways (all sections) and Beira and Mashonaland Railways
Owners Risk.

Baling Presses	Knives for Corn and Mealie Cutting
Bark Cutters	Land Rollers
Baling Wire	Maize Husking and Shelling Ma-
Binders	chines
Binding Twine	Manure Spreaders and Distributors
Broadcast Sowing Machines	Mattocks (for digging roots)
Bone Mills	Mealie Binders
Butter Churns	Mealie Grinders
Butter Tubs	Mealie Headers
Butter Boxes	Milk Buckets and Cans
Butter Workers	Milk Warmers
Butter Driers	Milk Pumps and Elevators
Chaff Cutters	Mowers
Cheese Vats	Oil Cake Breakers
Cheese Presses and Pans	Pasteurisers
Cream Separators	Planters of all kinds of seeds
Corn Drills	Ploughs, all descriptions and spare
Coolers, Milk	parts
Corn and Cob Grinders	Potato Diggers and Forks
Cotton Baling Presses and Gins	Railway Milk Cans
Curd Mills	Rakes
Cultivators	Reapers
Dam Scrapers	Root Cutters
Dairy Utensils, except of glass	Scythes and Sickles
Dip Baths	Scarifiers
Dipping Tanks	Shackles
Egg Boxes	Shredders
Fodder Shredders	Shellers
Grain Dressing Machines	Sheep Shearing Machines and
Grain Drills	Sheep Shears
Hand Chaff Cutters	Spraying Materials
Harrow (Drag, Disc and Pulverising)	Spraying Pumps and Syringes
Hay Rakes and Forks	Straw and Wind Stackers
Hay Collectors	Straw Trussers
Hay Presses (hand and power)	Sterilisers
Hay Loaders	Threshing Machines
Hay Tedders	Tobacco Planters
Headers	Trek Gear, Shackles, Yokes, etc.
Horse Gear	Weeders
Horse Hoes or Scarifiers	Winnowing Machines
Huskers	Wire (baling)
Incubators and Foster Mothers	Wheat Strippers
Kaffir Hoes or Picks	Wheat Harvesters
Kibbling Machines	Yokes

EXPORT OF MAIZE OVERSEA. BEYOND SOUTH AFRICA.

THE FOLLOWING ARRANGEMENTS ARE IN OPERATION FOR
THE EXPORT OF MAIZE OVERSEA.

I. The Railway Administration undertakes, subject to the following conditions, to receive consignments of maize (mealies) at any Station or Siding on the Main or Branch Lines between Beira, Nyamandhlovu and Plumtree (both inclusive), dispose of same, on account of sender, in England, at market price on arrival, and remit the amount realised by the sale of the maize, less 3/- per bag to cover Rail Carriage, Shipping Charges, Wharfage, Customs Entries, Stamps, Ocean Freights, Commissions and other charges (not sampling or superintendence) incidental to the conveyance and disposal of the maize on the English market.

- (a) The amount remitted to sender will be the price obtained on disposal, less 3/- per bag, including incidental market superintendence charges
- (b) The Administration does not undertake to land maize on the English market on any particular date, but the most expeditious transit reasonably and economically possible, will be arranged, and the maize will be disposed of in England as quickly as may be consistent with securing satisfactory prices at the rates ruling at the time.
- (c) Senders desiring an advance on their shipments may have same arranged on application being made to the Railway Chief Accountant, Bulawayo, or Stationmaster at point of despatch. The maximum amount advanced will be approximately one-half the current value as ascertained from the latest market quotations; such advances will bear interest at the rate of 6 per cent. per annum. The balance due after sale of the maize, *i.e.*, amount realised, less 3/- per bag as above, less advance (if any) and interest, will be remitted to the Sender by the Railway Chief Accountant or Stationmaster with as little delay as possible.
- (d) The Railway Administration will be responsible for ordinary risks, but against any special risks, such as heating, weevils, etc., consignors must insure themselves, if they desire to cover themselves against such risks.
- (e) Maize will be sold on weight as ascertained and certified at port of shipment; but, if necessary, an allowance of 2 per cent. for sifting and drying out in transit thereafter is claimed, should it appear that such loss has occurred.
- (f) The name or private code of the sender, together with the name or code mark of Station or Siding despatched from, as well as a letter indicating the Class of Maize, must be shown on the bags.

W	will indicate	White	}	Maize
FY	"	Flat Yellow		
RY	"	Round Yellow		
M	"	Mixed		

E.G.—A bag of White Maize say from Jones,
Bulawayo, would be marked ...



- (g) Consignor must perform loading at Sending Station.

GENERAL.

MINIMUM CONSIGNMENTS.—The minimum number of bags per consignment which will be accepted for export is 100 bags.

BAGS.—All bags must be new, double-sewn, and of 200 lbs. full weight nett, To ensure safe transit not less than 2½ lb. bags must be used.

GRADING.—All maize for export will be graded at port of shipment. Each bag will be marked according to grade. Maize not coming up to standard will be marked "Below Grade." Maize which is not authorised by senders to be examined and marked by the officer appointed for the purpose at port of shipment will not be allowed the benefit of the export rates, but will be subject to the ordinary Railway Tariff. Samples may be obtained from the Department of Agriculture, Salisbury, at a cost of 1/- per sample.

WEEVILS.—Maize found to be weevily before shipment will be immediately sold on account of whom it may concern, and will on no account be shipped. Moreover, where weevils manifest themselves prior to grading, ordinary and not export rate will be levied.

IMPORTATION OF LIVE STOCK.

Live Stock imported for breeding purposes, or for *bona fide* work on a farm, are allowed a reduction of 50 per cent. over the lines from Vryburg or Beira, as the case may be. The South African Railways (Cape Province) allow a reduction of 25 per cent. on breeding stock sent over their lines to Rhodesia if belonging to and consigned to farmers. Under no circumstances will the concessions be allowed over any of the Railways for Live Stock imported for slaughter or commercial transport. Application for certificates relating to the importation of Live Stock should be made to the Director of Agriculture, Salisbury, or to J. Woodin, Esq. (Examiner of Stock for Southern Rhodesia), P.O. Box 502, Port Elizabeth.



THE RHODESIA
AGRICULTURAL JOURNAL.

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assisted by the Staff of the Agricultural Department.*

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Editorial.

THE AGRICULTURAL UNION CONGRESS.—The annual meeting of delegates representing the various Rhodesian Farmers' Associations was held at Umtali on the Monday following the Agricultural Show, and was well attended. For the day previous to the Congress, the Manica Farmers' Association had arranged an excursion to the farms of Messrs. Meikle and Strickland. A large number of delegates from other districts took this opportunity of seeing something of the farming conditions around Umtali, and the precedent is one which, if possible, should be adhered to in future years.

Space does not permit of any lengthy reference to the discussions which took place, but a noticeable feature of the Congress was the earnestness with which wide interests affecting the general welfare of the country were discussed. With very few exceptions, the debates were brief, business-like and much to the point. The opening ceremony was performed by Mr. Myburg, M.L.C., and the chair was occupied by Mr. R. A. Fletcher, whose wide experience and

sound knowledge of many intricate questions which were raised were of immense benefit to the Congress. At the conclusion of the Conference, Mr. Fletcher was again elected President for the ensuing year, while Mr. Reid Rowland relieved Mr. J. S. Loosley of the onerous duties of the Secretaryship.

While relinquishing his post, Mr. Loosley has the satisfaction of doing so at a time when the Rhodesia Union is in a sound financial position, and we offer our congratulations to the Union on this very satisfactory state of affairs.

An important decision arrived at was that in future the Congress should be held during the month of February and thus previous to the Session of the Legislative Council. The advantage of this is obvious, and had such been the case last year, the Water Ordinance would probably have now been in force and riparian owners would be in a more satisfactory position to pursue irrigation improvements. Mr. Jarvis, the Acting Chief Veterinary Surgeon, read a short paper on African Coast Fever, illustrated with maps and diagrams, and indicating the best position on a farm for the erection of a dipping tank in conjunction with paddock fencing.

THE AGRICULTURAL SHOWS.—One again we have to record the unavoidable absence of cattle from our Shows. The date of the Bulawayo Show was purposely arranged in order that grass-fed cattle might be shown in good condition, and the necessary prohibition of cattle movement in that district did much to militate against the efforts of the Society. It is a matter of no little difficulty to decide the date of a Show so that it will suit the interests of both stock and arable farmers, and for the latter the Bulawayo Show was at least four weeks too early.

Though lacking in quantity, the quality of the produce exhibits was distinctly good, both maize and potatoes shewing an improvement over last season. The last named were particularly good, and the prize winning exhibit would have ranked high on any show. In the horse classes the general standard was considerably higher than last year, and some very creditable animals were seen in the ring.

The Salisbury Horse Show also was remarkable for the number of entries and the general good quality of several of the animals. The much dreaded horse-sickness is year by year becoming less to be feared in our towns, and the standard of horse flesh is improving accordingly.

The Umtali Show was chiefly remarkable on account of the produce, and a noticeable feature was the keen competition for the silver challenge cup awarded to the exhibitor obtaining the highest number of points in the produce sections. The issue was long in doubt; the runners-up being Mr. J. Meikle, Mr. Waight and Mr. Cockerell. The cup finally went to the first-named, who scored 61 points; Mr. Cockerell and Mr. Waight being second and third with 57 and 56 points respectively. Owing to an unfavourable season the entries from Moçambique Territory were less numerous than last season, but those of the Moçambique Department of Agriculture were of peculiar interest and included Ceara and Landolphia rubber, a kind of pitch obtained from the Mangrove tree, ginger, and an excellent collection of mineral bearing ores.

The Melsetter District again made a fine display, and most noticeable was the exhibit of flour and Boer meal by Mr. J. L. Martin. The maize classes produced keen competition, and the quality was for the most part good, but wheat was inferior, nearly every exhibit being damaged by grain weevil. Citrus and deciduous fruits were of high quality and once again emphasised the potentialities of the Umtali and Melsetter districts for fruit growing, while the entries for jams, confêtes and bottled fruits caused the visitor to wish that such locally produced delicacies were more readily obtainable in our main consuming centres. It may not be out of place here to suggest that the housewives of Melsetter might add considerably to their "pin money" by taking advantage of the preference which most consumers have for local produce, provided it is of good quality and not too expensive. It would appear that a waggon load of preserved fruits and jams would better repay the high transport rates that most other classes of farm produce.

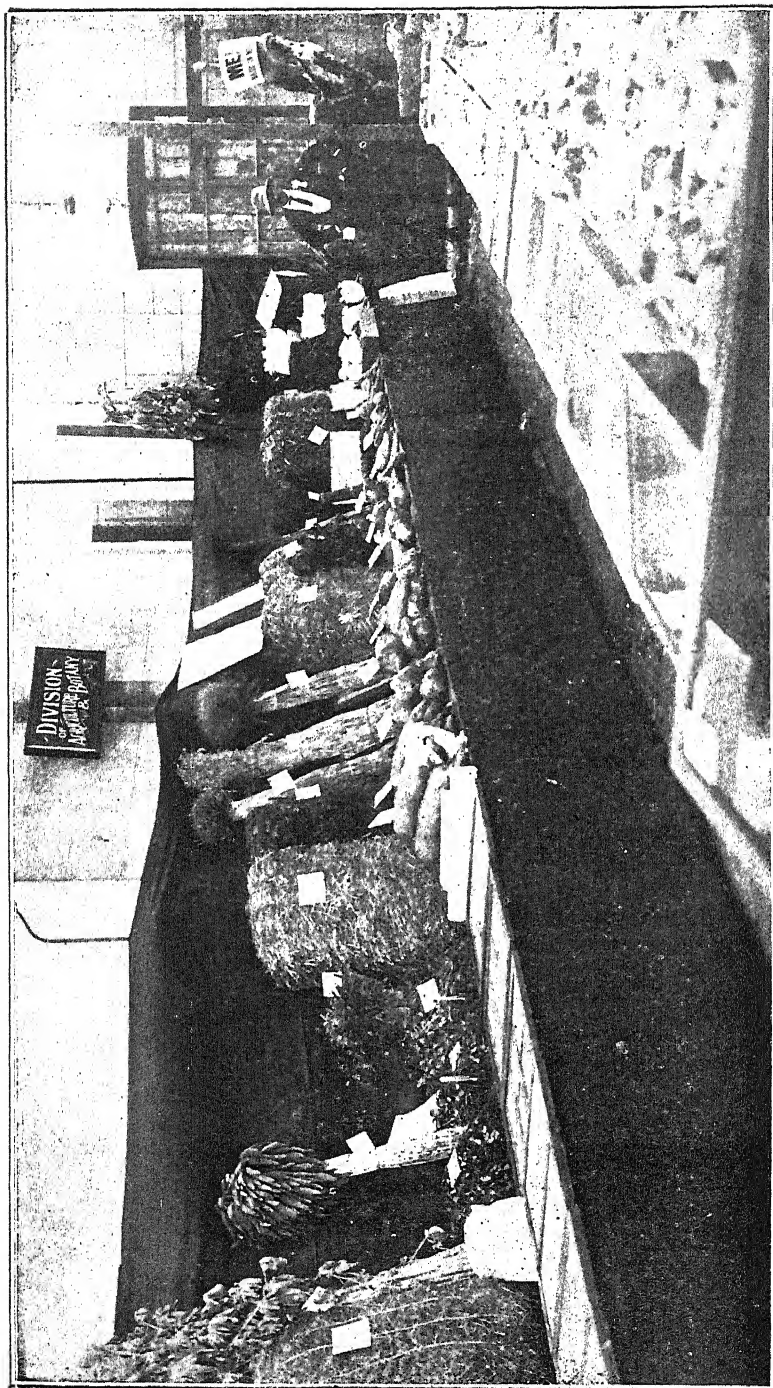
On the second night of the Show a banquet was held, at which the viands, with the exception of the wines, were all

Melsetter grown, and as one of the speakers remarked, "if the Melsetter farmers always live on such good fare, it is no wonder they consider their district the finest in Southern Rhodesia."

The exhibits by the different divisions of the Agricultural Department were on a considerably larger scale than in previous years, particularly those of the Agricultural Chemist and Entomologist. In the former specimen cases, containing samples of Rhodesian lime stones travertines (vlei lime) and tobacco soils attracted much attention, while in the latter the life history of ticks and various other insects of primary interest to Rhodesian farmers was clearly and simply shown by means of mounted specimens and photographs. Illustrations of the Departmental exhibits appear elsewhere in this issue, as also a photograph of the prize-winning collection of vegetables at the Umtali Show. It is safe to say that a better collection has seldom been seen in Rhodesia, and much credit is due to the exhibitor, Mr. J. Norris.

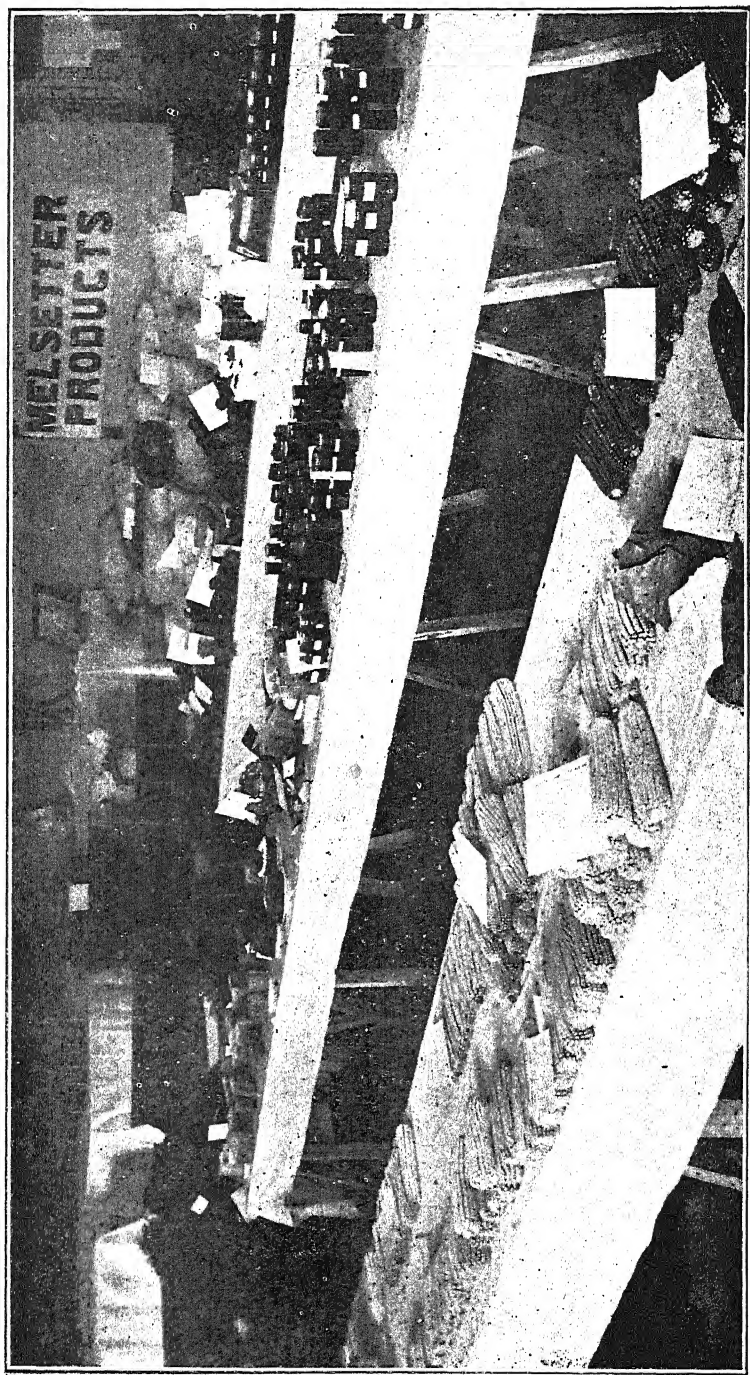
TOBACCO BARNs.—Attention is directed to the corrections appearing in this issue of the Journal to the specifications and quantities for the erection of Flue Curing Tobacco Barns. Full specifications and plans were published in volume 8, No. 2 of December, 1910, and the corrigenda have already been issued widely in pamphlet form.

Tobacco growers will learn with satisfaction that on this year's Estimates provision has been made for a Tobacco Specialist, who will be attached to the Agricultural Department, and will visit farms for the purpose of affording advice in the growing and handling of this crop. It is anticipated that this officer will be shortly appointed and prior to next planting season. In addition to rendering first-hand advice on private farms, it is hoped to institute an extensive series of tobacco experiments, including manurial trials. The far-reaching effect of different manures on tobacco is well demonstrated in the article by the Agricultural Chemist. The experiments under review were conducted at only one centre in the near vicinity of Salisbury, and the difference in



1 Shows.—Departmental Exhibit by the Division of Agriculture and Botany





The Produce Hall at the Umtali Agricultural Show



quality of leaf caused by the use of different artificial fertilisers is most striking, and clearly indicates how much remains to be learnt by further practical field trials.

MATABELELAND EXPERIMENT FARM.—At the last session of the Legislative Council, His Honour the Administrator, in his opening speech, gave notice of the Government's intention to establish an experiment farm in Matabeleland. At the time of writing the site of the farm has not been definitely decided upon, since it has been found somewhat difficult to obtain suitable land sufficiently close to the main railway line.

In addition to the growing of ordinary summer crops, it is hoped on this experiment station to demonstrate the latent possibilities of the vast stretches of naturally moist land for the production of winter cereals and also to ascertain those crops best suited to the lighter soils of this Territory.

LINSEED.—In the last issue of the "Agricultural Journal," attention was drawn to the success which is attending the growing of linseed in Southern Rhodesia and the opening which may exist for an export trade in this commodity. Information has since been received from the New Transvaal Chemical Company, Delmore, Johannesburg, that they are prepared to purchase linseed landed at Delmore Station, at £12 per ton (2,000 lbs.). The Rhodesia Trading Company have advised us that the shipping freights on linseed by the Rennie Steamship Company from Beira to Dundee or Aberdeen would amount to 55s. per ton, weight or measurement. The gross export charges on linseed exported in five ton lots from Salisbury to Dundee or Aberdeen would thus amount to £3 7s. 3½d. per ton (see railway rates, page 691, Vol. VIII, No. 5, June, 1911). Estimating the value of linseed on the home market at 55s. per quarter, or approximately £13 per ton, this would leave a net profit over export charges of approximately £10 per ton. Presuming that three and a third bags (667 lbs.) of linseed can be reaped per acre, a return of rather more than £3 per acre would be secured, and on this

basis the growing of linseed for export would appear to be equally profitable as the growing of maize with a similar object.

AGRICULTURAL LITERATURE.—Through the courtesy of Mr. J. G. McDonald, one of the Rhodes Trustees, the Agricultural Department has been placed in possession of a limited number of copies of the following works on South African Agriculture:—

1. The Agricultural and Pastoral Prospects of South Africa, by Owen Thomas.
2. Hints to South African Farmers, by J. G. McDonald.

As far as the number of copies permit these books are offered free of charge to readers of the "Agricultural Journal." Application should be made to the Director of Agriculture, and applicants will be required to forward stamps or post office order to defray expenses.

The postage on the first-named will amount to 1/-, and on the latter to 7d.

IMPORTATION OF BULLS.—The pedigree Shorthorn, Sussex and Hereford bulls imported by the Government from Great Britain arrived in Salisbury in the middle of July, and have been quartered at the Letombo Camp, about four miles from town, which has been converted into temporary inoculation stables. In order that the animals may not be unnecessarily disturbed they will not be open to public inspection except by written order of the Director of Agriculture. It is impossible to give photographs of all the animals, but three of the Sussex breed are reproduced in this issue, and others will appear in due course.

In addition to these stud animals sixteen imported bulls of high quality representing the following breeds: Aberdeen Angus, 10; Shorthorn, 2; Hereford, 3; and Galloway, 1; arrived in Salisbury on July 8th. These were imported by Mr. W. H. Williamson on behalf of several well-known local breeders. The animals are an extremely good lot and show great superiority of size over Colonial bred bulls of similar age. We hope that their present owners will have every reason to be satisfied with their purchases.

DIPPING AND FENCING.—In this issue of the *Agricultural Journal* prominence is given to the question of Dipping and Fencing. Mr. Jarvis in his paper read before the Agricultural Union Congress, indicates how best the system of paddocking and dipping can be combined on practical lines. The time for this is most opportune, for never in the history of Southern Rhodesia has so large a number of bulls of high quality been imported into the country. Many of these animals are destined to be the foundation stock of our future herds, and unless careful attention is given to regular dipping or spraying, it is certain that these animals will not grow out as they otherwise should do.

THE SOUTH AFRICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—The annual meeting of this Association was held at Bulawayo during the first week of July. As its name implies the object of the Association is the furtherance of Scientific Research in South Africa, and the meetings, which are held annually at different centres, afford workers in the wide field of science an opportunity of meeting and discussing with their fellow workers in other parts of the sub-continent those problems on which they are engaged.

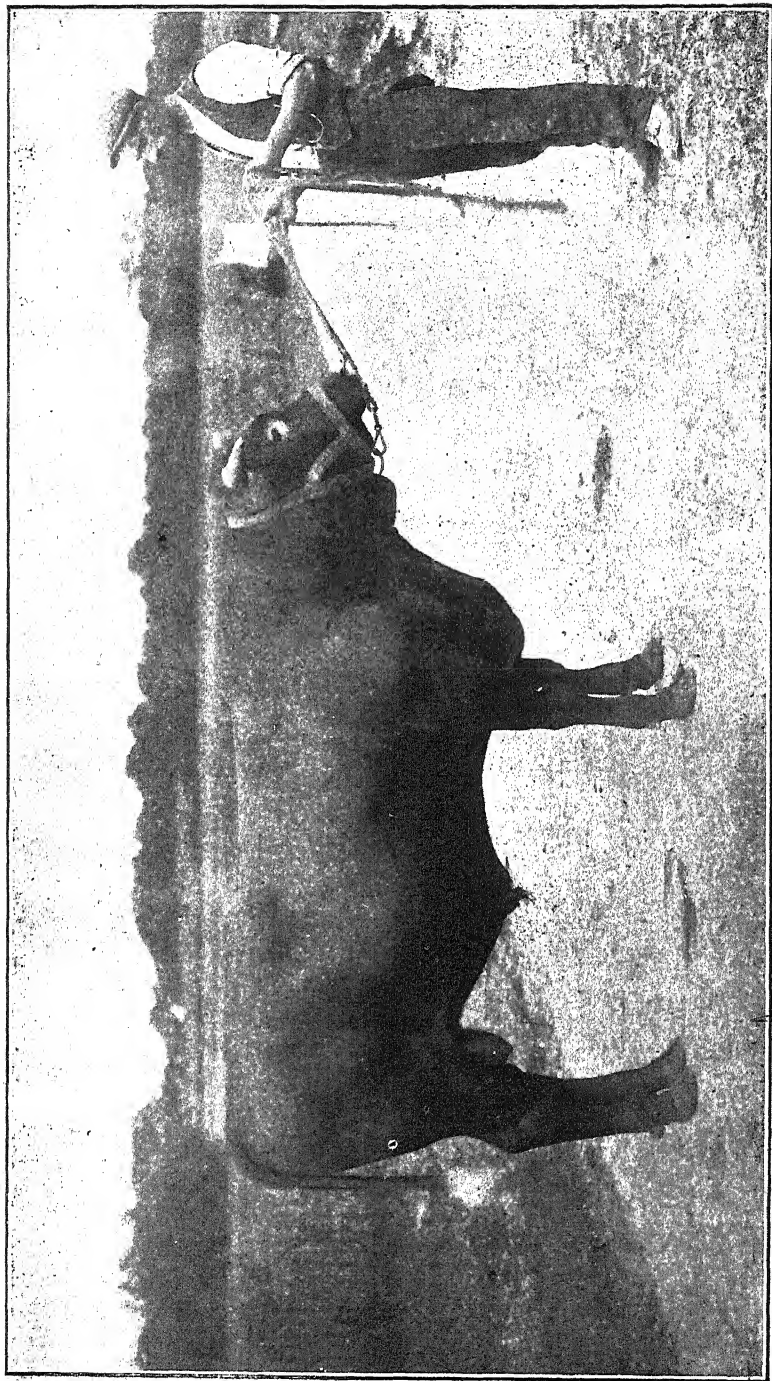
Numerous papers, dealing with educational, geological, chemical and kindred subjects were read, but it is only with those of more particular interest to agriculturists that space will here permit us to deal.

Mr. F. Eyles, M.L.C., President of Section C., read an extremely interesting presidential address, in which he traced the evolution of civilisation as largely dependent on scientific research, and emphasised the need for a greater share of State assistance. He pointed out that with but a few exceptions the technical officers of the agricultural and veterinary departments throughout South Africa were for the most part engaged in administrative duties which left but little time for Research. This is very true, but it is difficult to see how at present it can be remedied. As Mr. Eyles pointed out, in a young country research is of even greater importance than in older countries, but unfortunately the funds which can be allocated to this purpose are also equally more limited,

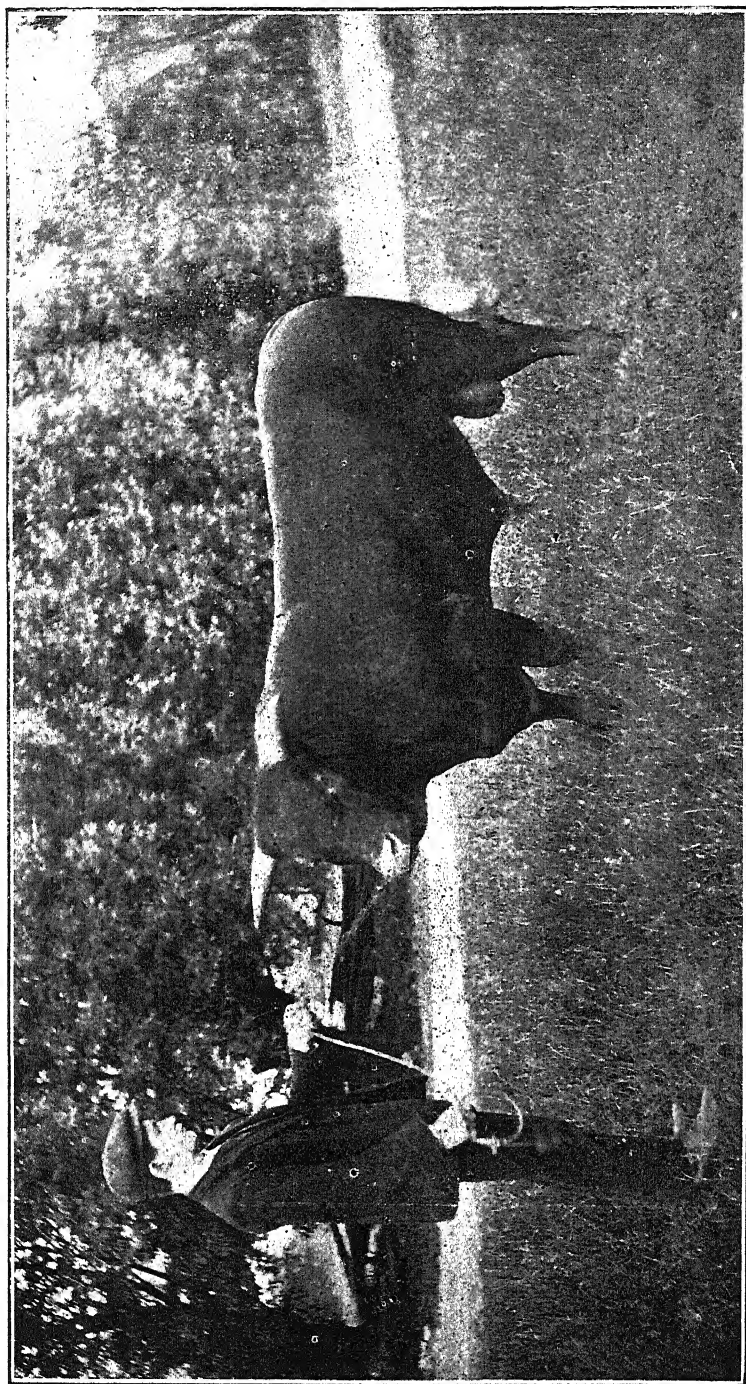
Mr. Jarvis, Acting Chief Veterinary Surgeon, read a paper on African Coast Fever, and a discussion followed in which several well known local stockbreeders participated with much interest.

A treatise on Trypanosomiasis in Rhodesia was contributed by Mr. Bevan, Government Veterinary Bacteriologist, and forms a most valuable addition to the literature on this subject. It is to be regretted that the Veterinary Department of the South African Union were not represented at the Association's meeting, since the discussion on the two last-named papers had been anticipated with much interest. Mr. Dowsett, Curator of the Matopo Park, summarised the experimental work in tree planting carried out at the Matopos during the last few years, and enumerated the trees which he considered suitable for planting on a large scale.

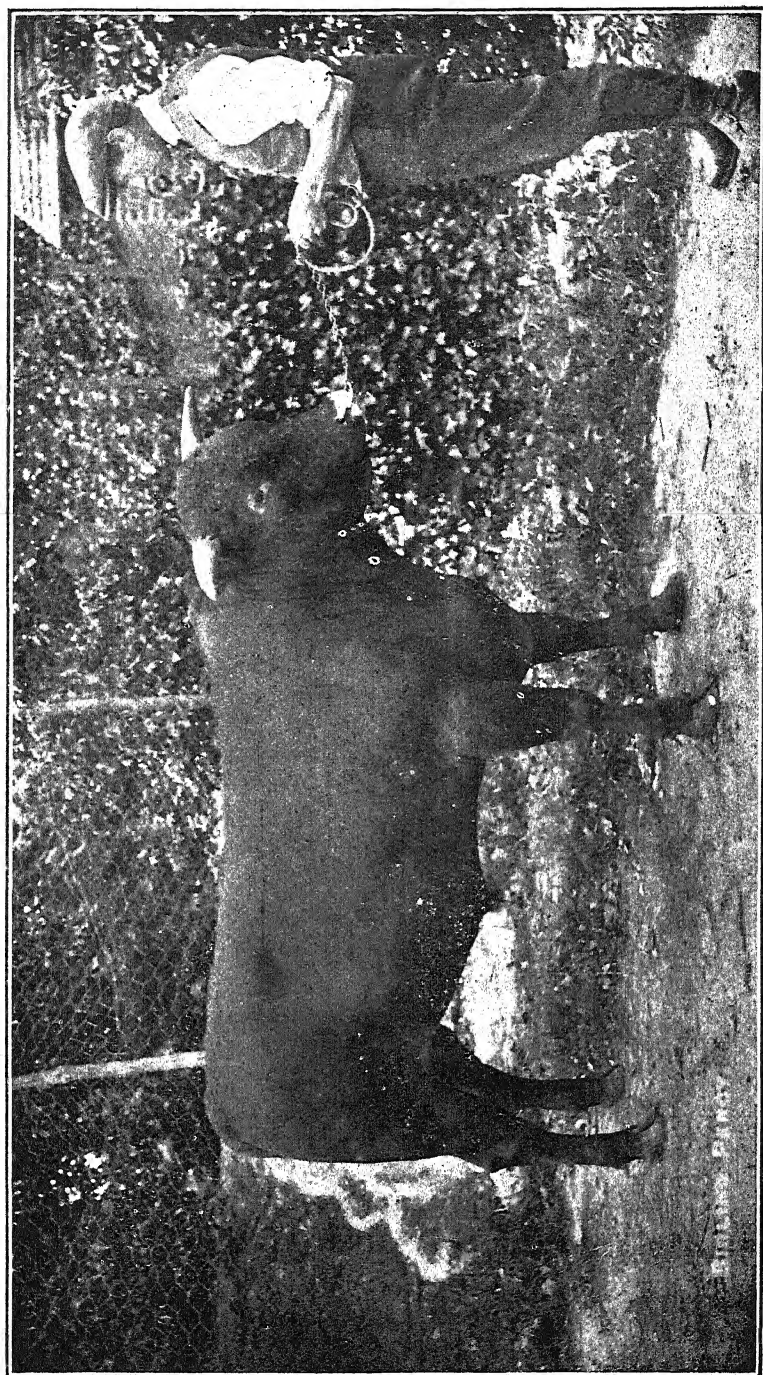
The sugar content of the maize plant when grown under certain conditions, has, during the past season, formed the subject of investigation by Mr. Blackshaw, the Agricultural Chemist, and the result of the first season's trials were communicated in the form of a paper entitled "The Sugar Content of Maize Stalks." It will be at least another season before any definite statement can be made either for or against the theory, but the investigation is of primary importance to a country so closely interested in maize growing as Rhodesia.



Pedigree Bulls imported by Department of Agriculture.—Sussex Bull from Mr. J. S. Cornwallis's herd



Pedigree Bulls imported by Department of Agriculture.—Sussex Bull "Bir-ling Cecil."



Pedigree Bulls imported by Department of Agriculture.—Sussex Bull "Birling Percy."

Devon Cattle.

By ST. C. B. GWYNN.

The origin of the breed of Devon Cattle is not known with any great degree of certainty, though there is strong evidence that the "red cattle" of the south-west counties of England are descended on one side at least from cattle brought in from Spain by the ancient tin miners.

Be this as it may, the Devon is probably the oldest of the present British breeds, and from it have been developed the Hereford, Sussex and South Devon. (I would here point out that the "South Devon" is not really a Devon at all. This so-called "breed" is the result of the infusion during recent years of alien blood into the Devon dairy cattle kept along the South coast of the county. They are probably the largest of English cattle, but the reverse of early maturing.)

As far back as we can go through authentic agricultural records, we find that the Devon breed has been preserved pure in the counties of Somerset and Devon. Here, through hundreds of years, variations of soil, climate and management have produced tribes, or sub-divisions of the breed, showing marked difference in size. The two extremes being represented by the comparatively small though almost perfect animals from the hills of North Devon, and by the large though less handsome beasts from the Somerset valleys. These latter being almost the size of the Sussex, which greatly resemble them. At the present time the tendency on the part of breeders is to combine the blood of these two subdivisions and some of the most perfect specimens of the Devon breed to-day are so bred. The size of the smaller animals has been increased, the coarseness of the larger have been toned down, and the general milking qualities of both improved.

At one of the recent Smithfield Club Shows the following live weights were recorded for animals over two and under three years of age:—Devon, 1,557 lbs. ; Hereford, 1,837 lbs. ;

Shorthorn, 1,845 lbs.; Sussex, 1,822 lbs.; Aberdeen Angus, 1,825 lbs. Since a well-fleshed Devon's average per centage of carcass to live weight is about 65, the steer above referred to would weigh 1,012 lbs. "dressed." Eight hundred pounds is not an unusual dead weight for a "two year old" Devon in prime condition.

As milk cattle the Devons do not compete with modern milking breeds, their yield being from 3 to 4 gallons per day. The milk is, however, very high in butter fat and other solids, so that 10 lbs. of butter per cow per week is not unusual, and 200 lbs. a year not a high average yield. Their dairy qualities are greatly appreciated in the South of England, where they are rented to dairymen at from £10 10s to £13 per annum. The ease with which the bullocks fatten for slaughter is one of the most striking characteristics of the breed. About four months is the time allowed for finishing off from grass. As one feeder expressed it: "The Devon bullocks swell into condition while you are looking at them." In colour the Devon is red with white brush of tail and white allowed on the udder. Any shade of red may be found, though the deep rich shades are preferred, from which they are affectionately called "Rubies."

A hundred years ago, as to-day, the breed was famed for the activity and endurance of the bullocks, the ease and rapidity with which they were fattened, and for the production of the finest quality of beef at a low cost. The cows were esteemed as producers of a good quality milk, very rich in butter fat, and from which the famous Devonshire and Dorset butter was made. About that time Robert Bakewell paid the breed the highest compliment it could receive, in saying, "The Devons cannot be improved by the introduction of any alien blood." We see, therefore, that for more than a century the Devons have been *general purpose* animals, and undoubtedly they were such, long before the Shorthorns, their only rival in this field, were heard of outside their counties of Durham and Yorkshire. It was the general purpose animal which was wanted a hundred years ago and which is wanted to-day.

About the middle of the last century the leading cattle breeders of England and America were carried away by the wonderful development of the quality of beef production, and believing that this was incompatible with good milking, they

neglected the dairy qualities of their cattle. The Hereford and Polled Angus breeders have never since attempted to breed for milk *and* beef, and do not claim the dual qualities to-day, except by suggestions in their advertisements, often intended to mislead the credulous. Occasionally, however, good milkers are found in each of these breeds. The Shorthorn breeders, after doing great injury to their breed, realised their mistake, and many have since bred for general purpose qualities, though even to-day the line between beef and milk production is clearly drawn. The prize winning Shorthorns at fat stock shows are almost invariably drawn from strains famed solely for beef production.

Very few of the Devon breeders were misled, the great majority of the leading breeders continued their efforts to perfect a breed yielding *as great a quantity of milk as is compatible with the highest qualities of beef production.*

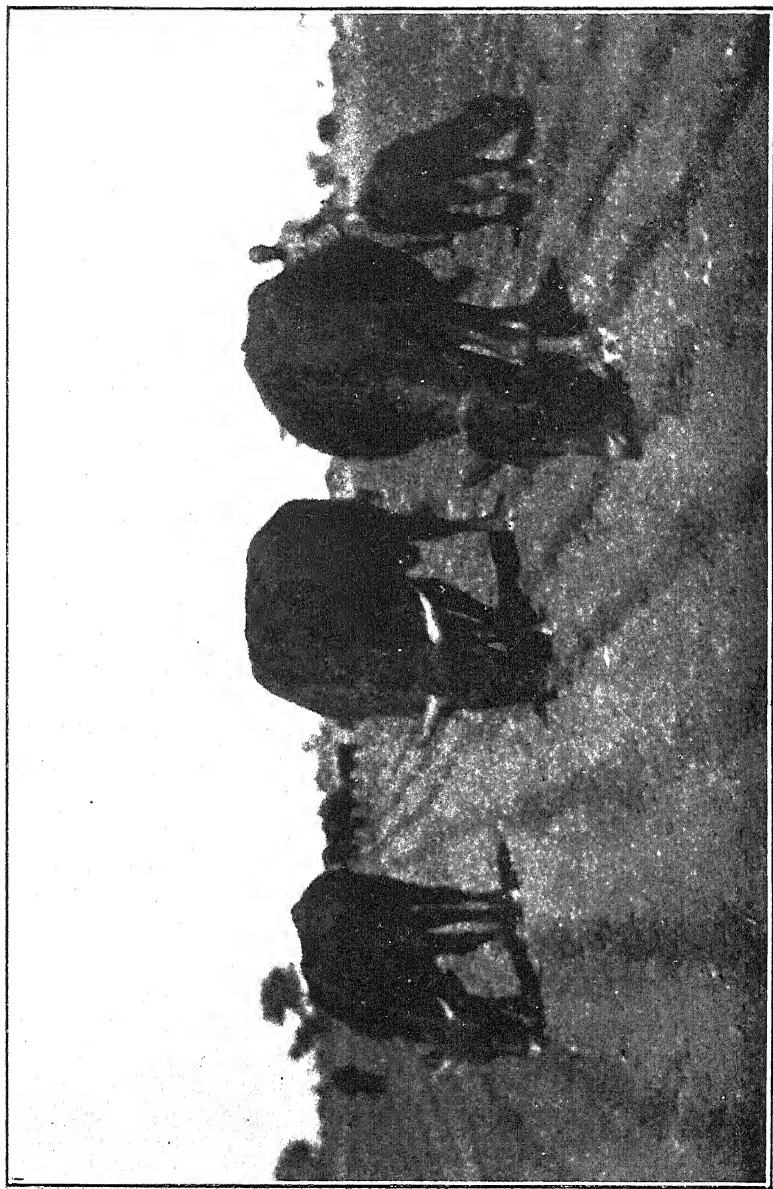
We can readily understand that no breed of cattle has been so far perfected as to produce animals giving 5 to 7 gallons of milk, and possessing high qualities of beef production, as these qualities are understood to-day, and no such claim would be put forward by any breeder of standing. At what fat stock show did the "Lincoln Red" or the "South Devon" bullock ever show high flesh producing qualities?

In these days of keen competition, advertising plays a prominent part. The interests of each breed are watched over by one or more "Breeders" or "Herd Book Associations" which record showyard victories and successes on the ranch and farm. Every success is trumpeted abroad and failures, if recorded, are carefully concealed or excused. Most breeders are enthusiasts and contribute their share to the breeds advancement and to their own financial advantage incidentally. The Shorthorn and the Hereford associations are very wealthy and powerful organisations. Whether they have learnt their scheme of advertisement from the patent medicine man, is uncertain, but there is a striking similarity between the literature of these Associations and that of the proprietors of the "all healing preparations." Apropos of this it is worthy of notice that in spite of a very conservative and fair statement made by Mr. L. E. W. Bevan of the qualities possessed by the Sussex breed of cattle, a recent advertisement from an English firm of cattle brokers states that the animals of the

Sussex breed, "when tried in Rhodesia and elsewhere have been found to be more disease resisting than any other breed." Unwarranted as is this conclusion it is mild compared with Mr. Granger's claims for the Hereford. While Mr. Collins, in his interesting statement on the merits of the "Lincoln Red," is so carried away by advertised qualities, that he almost leads us to believe that in the "Premier Agricultural County of England," Lincoln red prize winners are produced from a frosted turnip and a glass of stagnant water.

An old fashioned prejudice on the part of Devon breeders against parting with their really good animals, and their failure to keep pace with other breeds in the race of advancement, largely accounts for the ignorance prevailing to-day regarding the merits of this breed. This coupled with the overwhelming "fashion" and popularity of the Shorthorn, the Hereford, and the Polled Angus has left Devon cattle in the rear in point of numbers exported. It has, however, been of great benefit to the breed, as the best have been kept at home and used for further improvement.

At the Royal Agricultural Show in 1907 there was not an all red Shorthorn bull over three years of age on exhibition. On enquiring from one of the leading breeders why this was so, he told me that no sooner was a good red bull produced than he was bought up for export to the United States or to the Argentine. It is easy to see that this must ultimately result in great detriment to the breed in Great Britain. In the last few years there has come about a great and constantly growing demand for Devon cattle both in England and abroad. Last year there were more than three times as many animals of this breed shipped to various countries as in any previous year. Amongst other buyers the Japanese Government bought heavily as a result of an examination of the various breeds of Great Britain. There was also shown a marked increase in the number exported to other markets, Australia, South Africa, South America, and the United States, where they are in many cases being used to convert into grade Devons, the cattle of other modern breeds which have failed on the farm or ranch. The United States Government has issued a report on the various beef breeds in vogue in America. In speaking of Devons it sums up as follows :—



Family Group.—Devon Cow, 5-years old, has had these three bull calves in 26 months



Mr. Gwynne's Devon cows with calves



Some of Mr. Gwynne's Devon heifers



Devon Heifers



Devon Cows on Mr. St. C. Gwynne's farm

"The 'little Devon' is a bovine exemplification of the familiar bit of homely philosophy, that articles of much value are often found in small packages. Mature bulls do not often weigh over 2,000 lbs.; but for high quality, fattening purposes, compactness of flesh and perfection of form, splendid handling and beauty when finished the Devon is a model. With all their value for beef production the milking qualities of the Devon have not been allowed to deteriorate, which gives them a special importance with the farmer in a system of diversified agriculture. They are very hardy and great rustlers, and their value in regions of scanty pasture follows as a matter of course. Devon bulls are used to some extent in the range country, especially in Texas, giving much satisfaction. Their great value there would seem to warrant the extension of the breed on our lighter pastures,"

Were it possible to have an environment equally well adapted to each of the four great beef breeds, one could safely be governed by personal "fancy" in making a selection of a breed.

Unfortunately, however, there exists no such environment, and the intelligent selection of a breed for any farm or for any ranch needs careful consideration. With all respect to the several authors of the articles on breeds of cattle suitable for Rhodesia, which have from time to time appeared in the Journal, I suggest that many of them have been carried away by their most excusable enthusiasm for their favourite breed. Further, they have paid more attention to the abstract merits of that breed and to the qualities of an individual animal than to a consideration of the effect which the influences of environment will have upon the progeny of the animals they have imported.

The influences of environment as defined by modern authorities on cattle breeding, include: (1st) Climatic Conditions; (2nd) Details of Management; (3rd) Food Supply in Addition to Pasture; (4th) Pasture.

Climate exerts a considerable influence on the constitution of animals, and "hardihood is the very essence or core of constitution." Hardiness, therefore, is a very desirable quality for all cattle, but it must be combined with the other valuable qualities of milk or beef production. The buffalo is certainly more hardy than even the Devon, but the lack of

docility and the slow maturity of the former make it much less valuable than the Devon in a scheme of stock breeding. The Bush-pig has greater hardiness, greater activity and greater rustling powers than the Yorkshire, but as a large proportion of its weight is carried forward, and as it does not take kindly to pen feeding, the Yorkshire is more popular with both the pig breeder and the butcher. In other words "that *degree* of constitution which is consonant with the highest powers of production is sufficient, and will vary with the object for which an animal is bred." All the English breeds of cattle are hardy, some are more so than others, but this degree of hardiness varies greatly in certain strains and families. This variation of degree of hardiness is due to the extent to which the animals have been subjected to natural conditions of climate and food. For this reason the great breeds of the North of England and of the Channel Islands have through years of inbreeding, shelter, and food supplemental to grazing, secured great flesh or milk producing powers at the expense, as many breeders think, of a too great loss of hardiness. As proof of this we have only to consider the statistics showing the number of animals of certain of these breeds known to be affected with tuberculosis.

The breeds of the South of England are still reared under conditions which are largely natural in so far at least that they receive little shelter. Amongst domestic animals it is found that those so reared most readily adapt themselves to climatic changes and that they are acclimatized to new conditions more readily than others. Size has also been found an important factor in acclimatizing power. "As a rule the medium and even the smaller breeds may be *successfully* distributed over wider areas than the larger." A temperate climate such as England, given proper management, is productive of animals of the highest degree of utility and any change from such climate is unfavourable.

Details of management are, of course, of great importance, but as these are the acts of the individual breeder, they can be disregarded in this article.

Perhaps the most important of the influences of environment is food supply in addition to pasture, but as we are here considering a breed for ranching purposes this influence need not be gone into. Personally, I do not think that we

shall ever do a great deal of ranching in this country, that is, there will be very few cattle kept strictly under ranching conditions. The great value of cattle now-a-days is to give us our best market for farm produce, and with the abundant summer rain-fall and fertile soil, we in Rhodesia will be very short-sighted if we do not provide at least a certain amount of winter feeding, or in other words keep our cattle under what are known as semi-range conditions. The influence of food in perfecting and maintaining the modern breeds of cattle cannot be over estimated, and British breeders owe their premier place not so much to their skill and patience, as to the abundant variety and unexcelled quality of food products utilised.

The influence of pasture is scarcely less great and many authorities on animal breeding accord first place in importance to this factor.

It is not, however, within the scope of this article to consider in detail the influences of environment. These influences may be summed up in what may be termed the maxims of animal breeding.

(1) "Nature operating in food and climate is imperious and will produce cattle proportioned to these circumstances whatever the original size of the breeding stock may have been.

(2) Heavy breeds on spare pastures deteriorate not only in size but also in useful qualities.

(3) Pastures intermediate in character are best adapted to sustain animals of medium size.

(4) Animals whose size is adapted to the character of their pasture will often keep themselves in the pink of condition when animals too large will fare badly.

(5) Rich pastures tend to increase the size of small breeds, and small breeds often prove as profitable on such pastures as the large breeds, as greater numbers can be carried to the same acreage.

(6) Large breeds suffer more from heat than the smaller ones, and coupled with insufficient food supply deteriorate more quickly.

(7) Pasture coarse in character produces coarse flesh.

(8) Animals more readily accommodate themselves to climatic changes under conditions in advance of their exact needs than under those that fall short of the same.

These facts will be further illustrated by a consideration of the following figures taken from the census of the United States and of other countries. Less than 5 % of Shorthorns are on ranches, the remainder are kept in small numbers on arable farms. In the United States scarcely 12 % of Herefords are on ranches, and the stronghold of this breed in that country is in what is known as the South West. Ranching there serves merely as a means of raising young animals, which are shipped away to the grain belts to be fattened for market.

Probably the greatest ranching State in the world is Texas, where the grazing is good in summer and inferior in winter, and yet about ten years ago about eight million cattle were living there under ranch conditions. It is in this State that the Devon as a ranching breed is best known, and pure bred Devon bulls are always in keen demand. I have heard of but one instance where the Devon breed once established was discarded for another, and that other breed was the Red Poll. In this case as the owner expressed it, he graded his Devons into Red Polls to save himself the trouble of dehorning. On the other hand I know of many instances in which thousands of cattle of some other breed have been crossed with Devons and graded into "Rubies" for the reason that the other and larger breeds have failed to give satisfactory results on light pastures. This grading into Devons is being done to a large extent in parts of Australia, South America and the United States, and there are hundreds of recorded cases in which Shorthorns and Herefords in particular have been graded into Devons. I merely cite this in evidence of the fact that where grazing is light it is a great mistake to attempt to utilise any of the heavy breeds which are in size beyond the capacity of the soil and food supply. It is a mistake which has been made by thousands of breeders all over the world. Many have realised their error in time to correct it profitably. Others have not been so fortunate. This mistaken selection accounts for the fact that thousands of ranchers and farmers have struggled along barely earning a competence, while others having made a more intelligent selection, have been financially successful.

I beg to quote from an address by Dr. French, who has, in what is probably the greatest ranching country in the world,

"The River Plate," a herd of over 3,000 pure bred Devons. After stating the conditions of grazing in that country, he says:—

"We have now to consider what breed or breeds of cattle are best suited for these conditions. May I call to your memory some of the older breeders' maxims, which may make my argument clearer, and are of great assistance in selecting a breed for a particular locality. Every pound of weight represents so much food or its equivalent, It is vain to try and increase weight beyond the capabilities of the soil or food supply. Another important system often neglected in the Plate is to proportion the size of the beast to the quality of the pasture, and it is better to have cattle rather undersized than too large. Now, of the British breeds of cattle, the Shorthorn, Polled Angus, Sussex, and Hereford may be classed as the larger breeds. The Devon, the Galloway and Red Polled are representatives of the middle breeds; while the Jersey, Dexter and Kerry are the smaller breeds. It must follow that the larger breeds require more food than the middle breeds, and the middle breeds require more food than the smaller ones for their proper growth and development. The larger breeds can only be reared where there is a constant and plentiful food supply all the year round. This condition rarely exists under the present system of cattle-raising in the River Plate. The middle breeds can be reared on much less food than the larger breeds, and the food supply is sufficient or nearly so to develop them; therefore, the middle breeds are better adapted to the existing condition of stock raising in the Plate. The smaller breeds are chiefly milking breeds, and therefore are unsuitable for beef production.

If these principles are true it must be admitted then that the medium size breeds are best adapted to the majority of the camps of the River Plate, and it cannot be doubted that the Devon is the best graziers' beast of the middle breeds. The best known breeds in the River Plate are the Shorthorns, next the Hereford, then the Polled Angus, and lastly comes the Devon. Let us glance at the weights of these respective breeds as given in McConnell's 'Agricultural Notes' for steers over three years old, as shown at Smithfield, compare their embryonic condition of weight, and contrast with

the same breeds as shown at the fat stock show at Pysandu in the Uruguay. Shorthorns, 1,033 kilos; Hereford, 971 kilos; Polled Angus, 966 kilos; Devons, 826 kilos. If we take the weight of the Devon at 826 kilos, we find the Shorthorn weight 26 per cent. more than the Devon, the Hereford 21 per cent., the Polled Angus 18 per cent. Now, when three of these breeds are brought in competition at the fat stock shows (in the Plate), we find the averages of the shorthorn are 642 kilos; Hereford 650 kilos; Devon, 658 kilos. We here see that the Shorthorn only obtains 62 per cent. of the Smithfield weight, the Hereford 67 per cent., while the Devon reaches as high as 80 per cent.; or, in other words, the Shorthorn loses through variation 38 per cent., the Hereford 33 per cent., and the Devon only 20 per cent., as compared with the Smithfield weights. Here we have an illustration of the truth of the axiom that nature, operating on food and climate, is imperious and will produce cattle proportioned to these circumstances whatever the original size of the breeding stock may be. It follows, therefore, that to get all the advantages that the Devon breed offers, it will be necessary to select sires of a size and weight in direct relation to the richness or poorness of the pastures. We have, in the Devon breed, a great variation in size, dependent on the geological formation of the country and the quality of the pastures. From the hills of North Devon come those exquisite symmetrical models of the butcher's beasts, that roam at liberty 3,000 feet above the level of the sea, smaller in type and more active than the same breed reared on the richer herbage of the vales of Somersetshire, whose size will fill all requirements and vie in weight with almost any breed. Between these two types, sizes can be selected that evenly maintain the balance between weight and food supply. Now the more that this balance is studied and *acted* upon the greater will be the success in breeding, rearing and fattening of cattle."

The following is a copy of a letter addressed to Dr. French by Professor Robert Wallace, who holds the Chair of Agriculture in the University of Edinburgh:—

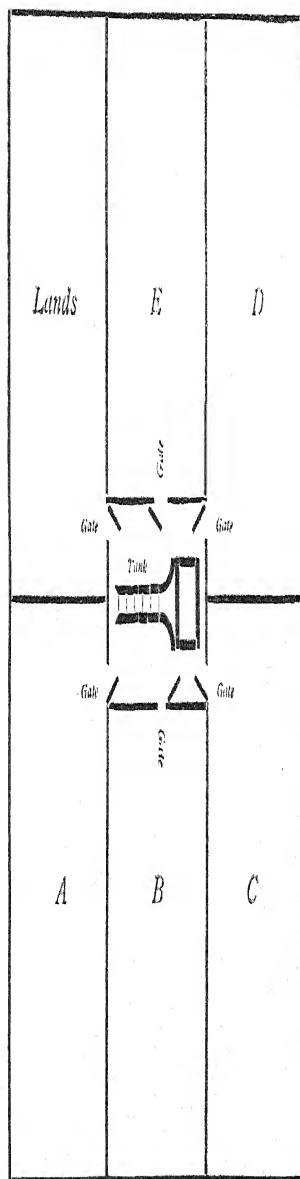
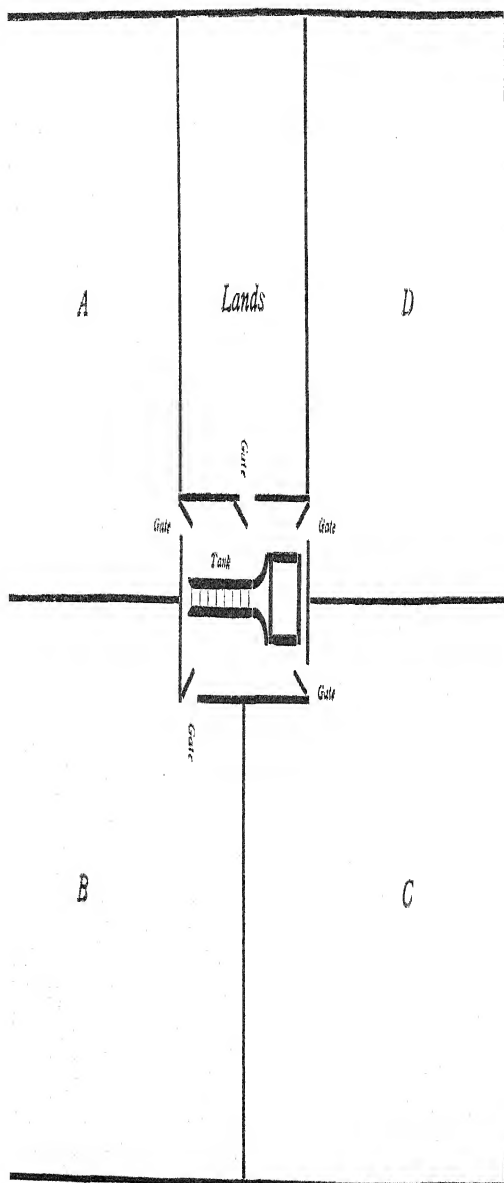
"Dear Dr. French,—I have read your excellent address with much interest, and I may say I thoroughly agree with what you say. You make out most deservedly a very

strong case for your favourite "Rubies," where soil and climate combine to pinch your herds at certain seasons of the year. *Under such conditions there is no British breed better suited to give satisfactory results*; moreover, there is no breed which nicks better in crossing with the native cattle of Spanish origin. This, along with other evidence in the same direction from other parts of the world, leads me to think that there is far more truth than is usually admitted in the assertion that the red cattle of North Devon are probably descended, on one side at least, from cattle brought from the Spanish Peninsula by the people who came to mine in the South-West of England in the remote past. If this be so, then the Devon cattle are not only related to the native cattle of Argentina and Uruguay, but to Texan cattle, and to the Afrikander Devon cross, and for the likeness which exists in the Afrikander to the Devon breed. I think it is very necessary that there should be a register of high-grade Devons. I hope for the main object for which you are giving your address, viz., to make the people of this country up to the knowledge of the fact that the Devonshire breed of cattle possess unique qualities for ranching purposes, and in large sections of the River Plate countries, vast areas would pay better *stocked* by Devons and their progeny by Native Crollo cows than by any other breed of cattle with which I am acquainted.

(Signed) ROBERT WALLACE."

Although a sincere believer in the magnificent qualities of the Hereford and intending when I came here to breed Herefords, after one winter in this country I came to the conclusion, that, for reasons stated above, the Devon was the breed most suited to the conditions existing in my district and in those parts of Rhodesia of which I had some knowledge. It is possible and I hope also probable that there exist in Rhodesia large grazing areas capable of maintaining the heaviest of the beef breeds. If, however, such large areas do not exist, it is no reflection on the country or on its grazing qualities. There are but few grazing areas in the world where the heaviest breeds give satisfaction to the discriminating breeder, and the fact that the heaviest breeds are *not* the best ranching animals, is now being generally admitted all over the world.

Sketch Plan to illustrate recommendation to Sub-divide Farms.



To summarize :—

The term "little Devon" is very misleading; a good two-year old Devon Bullock is almost as heavy as our largest native or Afrikaner of ripe old age.

The size, colour, activity and hardiness of the Devon makes it an ideal animal for at least a large part of Rhodesia.

The cows are capable of giving as great a quantity of rich milk as we are justified in expecting from a general purpose animal on our grazing, and they respond readily to feeding.

The bullocks are quick, active, excellent for the yoke, good graziers and feeders, and at an early age produce an almost ideal carcase.

The bulls should produce excellent grade animals from local bred cattle, particularly from Afrikaners.

Which ever breed may be selected by our ranchers and farmers in this country, I trust that the mistake of using "grade" or "cross-bred" bulls will not be made.

There is nothing more pernicious, nothing more fatal to the cattle industry in any country than using for a sire any animal bred out of an inferior or other than a pure bred female. It is to be hoped that no breeder, rancher or farmer will allow himself to be tempted by the cheapness or by the outward appearance of such animals to make use of them as sires. So far as their preparedness is concerned, they are like the Pharisee.

Rhodesian farmers are justly proud of being modern and up-to-date in all agricultural methods and appliances. To use inferior, "cross bred" or "grade" sires, in attempting to grade up their cattle, would be making the mistake which was made forty years ago in the Americas and in Australia. The great number of "off-coloured," leggy "weeds" which were produced by such sires almost put an end to "grading-up" on ranches and farms.

The liberal terms on which acclimatised bulls can now be had from the Department of Agriculture, puts such animals within the reach of every man, even if he cannot afford or cannot obtain locally bred bulls of high quality.

The Protection of Farm Stock against African Coast Fever.

Read before the Farmers' Union at Umtali, 1911.

By E. M. JARVIS, F.R.C.V.S. Acting C.V.S.

Very considerable progress has been made in the researches into African Coast Fever since your last Conference. Dr. Gonder has very largely traced out the life history of the casual parasite, Theileria, or, as it used to be called, Piroplasma parva.

He has proved that the parasites undergo two productive or multiplying cycles during their lives, one in the beast and the other in the tick. It is during the latter passage that a reinforcement of vitality on the part of the micro-parasites takes place, leading to their multiplication or production, and quickly causing the blood of the cattle to be grossly invaded soon after the tick has become attached to its host. Mr. Robertson, many years ago, stated that many cases of African Coast Fever occurred in which he was unable to obtain microscopical evidence of parasites in the blood, and our Rhodesian experience of late has fully verified that earlier statement. Your Veterinary Department here, whilst having its hands full, has been recording many curious facts. One is that Coast Fever is preceded by two or three cases of a low and indefinable fever, and that it is not usually until the fourth animal falls sick that Coast Fever can be proved microscopically. Another fact is that nearly all these cases occur during December, January and the early part of the year.

The factors, and some other observations bring us to the eve of a discovery which will have important bearings upon our future conduct of Coast Fever operations. I am going so far as to state that seasonal dipping and the change of pasture at stated intervals will put Coast Fever *hors de combat*, for we shall strike at the weak link in the chain of the life

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history of the *Theilera parva*, and cut off their lives before they arrive at a state of harmful maturity, as one would destroy a plant before it seeds, to propagate its kind.

I must not be led too far in the elaborations of a theory, as there is much that has yet to be proved by patient toil and research, still, there is something to say for the deductions, and the more one delves into the problem or gives it thought, the more strikingly convincing does it become.

I have already stated that dipping will play the main part in dealing with the disease, and the thanks of South Africa are due to Dr. Watkins-Pitchford for his experiments in dipping and syringing. His latest laboratory dip, consisting of :—

Arsenite of Soda (80% arsenic)	...	...	4 lbs.
Soft Soap	...	...	3 "
Paraffin	...	...	1 gall.
Water	...	...	400 galls.

can safely be applied every third day, and gives us at last a dip which can be used at short intervals, and so catches the larvae of the brown tick before they drop off. These only stay on their bovine hosts three to five days, and have hitherto defied our attempts to eradicate them by dippings conducted by longer intervals. To make the dipping more efficient, it is advisable to have your dipping tank situated somewhere in the middle of your farms, at a spot where four or more camps can be made to abut on one another, so that the one tank is available for use when the cattle are depastured on any one of the four areas.

I recommend that Camp, say "A," be made use of during the months of December, January and February; Camp "B" during March, April and May; Camp "C" in the months of June, July and August, and Camp "D" during September, October and November. I have reasons for this recommendation, and I feel sure that future research will prove me correct. Now, as for frequency in dipping, during the period December to February, every five days or better every three days, should be the interval. During the months March, April and May a like frequency should be indulged in. From June to August, it will not be necessary, in my opinion, to dip so frequently, perhaps, as events may prove, not at all,

unless the disease be actually visible or rife in the herd. In September, October and November, the writer believes that future research will justify his faith that it will not be necessary to dip at all so far as the prevention of Coast Fever is concerned, but not, of course, tick eradication. The change of the paddocks will also result in another beneficial process, viz., that the ticks which do remain behind, and rely solely upon cattle for their repletion, will be starved and die; or if they survive by sucking the blood of wild animals, or a species other than bovines, they will be cleansed of infection and so be harmless when the cattle are turned into camp after its nine months' vacation. It is fortunate that short interval dipping has been made possible during the present recrudescence, as closer settlement is making the temperature camp system of eradication a growing impossibility, and the situation now demands another method of dealing with the plague. The first case or two of Coast Fever will probably be destroyed as formerly, in the attempt to nip the outbreak in the bud, but on more cases arising, the method will depend on close isolation of the sick, with change of pasture for the non-febrile ones, and the subjecting of all to dipping at three day intervals. Those living near infected areas will appreciate the advisability of sub-dividing their farms at the earliest opportunity so as to be prepared for emergencies. I should also advise you not to allow grazing on your "lands" during the months September, October and November, so that they may not become infected by Coast Fever, and then, should it be your misfortune to have the disease paying you a visit, you will still be able to cultivate your lands with little or no danger to your draught cattle, make use of your forage crops with safety, and so maintain your livelihood whilst securing yourself against grave loss.

I thank you for your attention, and will conclude by asking you to study the plan in the light of the advice I have just put forward.

Chicory Growing.

By H. GODFREY MUNDY, F.L.S.,
Government Agriculturist and Botanist.

A limited market exists in South Africa for chicory-root (*Cichorium intybus*). The most important use of the root is in the adulteration of coffee, and not a few people prefer an admixture of chicory and coffee to pure coffee. It may be pointed out that this adulteration is perfectly legal and the presence of chicory does not appear to have any injurious effect on the human system.

In Europe the young root of the chicory plant is boiled and used as a vegetable. Chicory also plays a part in the *materia medica*, and occasionally in the preparation of snuff and porter.

On the dry South Downs of England the plant was once in favour for mixed pasturage, but possesses the disadvantage of becoming hard and woody after flowering. In America, after lifting the crop, the tops are often fed to stock, but if used for dairy cattle they are said to taint the milk.

From a Rhodesian point of view the main interest of the crop centres around the market value of the dried root, and though the demand for the commodity is not very extensive, it yet runs to a matter of several thousand pounds annually. The importation of Chicory from overseas into the Union of South Africa is subject to a duty of 2d. per lb., while Rhodesia's importation of ground chicory during the last twelve months amounted to 30,000lbs., valued at £329, of which only 4,500lbs., valued at £73, represented South African grown produce.

Chicory root is purchased by several South African firms, and of these, Messrs. T. W. Turner, 117, Prince Edward Street, Durban, recently informed the writer that they would be prepared to take up to 100 tons of sun-dried root annually, at £17 per ton, delivered at the Durban factory. The local

demand is, however, at the best comparatively limited, and growers of chicory should assure themselves of a market before planting on any extensive scale. Half an acre is sufficient for an initial trial, and if it is not desired to lift all the roots, the remainder of the plot can be depastured with sheep or cattle, and will afford a green bite in late autumn.

During the past season a comparative trial of two varieties of chicory was carried out on the Botanical Experiment Station, Salisbury. The land was two years under the plough, the first crop having been maize. The plots received no manurial dressing, were grown under strictly natural conditions, and were handicapped by the fact that the land had only been ploughed to a depth of about eight inches. Further, the red soil of the experiment station is of too tenacious a character to suit chicory, and many of the roots were broken in the lifting.

The seed was drilled in rows of 15 inches apart on December 24th, and on January 20th the plants were single out to stand about 5 inches apart in the row. The land was clean and the crop was only once hand hoed after the singling-out process. The rainfall during the time the crop was in the ground amounted to 23·2 inches, and the total for the season to 30·9 inches. The varieties under trial were Magdeburg and Brunswick. The former has a long tapering root and leaves with slightly serrated margin. The root of the latter is shorter and considerably thicker at the crown, and the edges of the leaves are deeply serrated. The crop was lifted on June 29th, or approximately six months after planting. The yield of "green" roots was as follows:—

Brunswick	9 tons per acre.
Magdeburg	7¼ do.

It is stated that on one of the Natal Experiment Stations twelve tons of green roots were grown per acre on unmanured land. That in sun curing these dried out three-quarters of their weight, leaving three ton of dry root. This was, probably, a particularly good crop. From the Transvaal yields of from five to eight tons of green roots per acre are reported, while the average crop in America is stated to be from six to eight tons. The Rhodesian experiments may therefore be considered satisfactory, more particularly in

view of the fact that the land was naturally of too heavy a character and had not been specially prepared for a deep-rooting crop. The larger yield of the Brunswick variety was in part due to the fact that, being more shallow rooted, it was more readily lifted, whereas, owing to the hardness of the sub-soil many roots of the Magdeburgs variety were broken and part of the crop was therefore left in the ground. The quality of Madgeburg is considered superior to that of Brunswick chicory and buyers appear to prefer the former.

Soil.—The chicory plant is extremely hardy and will grow on most kinds of soil, but the best root production will be found on land of a loamy character. A good carrot soil will generally grow good chicory. Depth of open sub-soil is essential, since with varieties like Magdeburg the length of the tap root may exceed 12—15 inches. Both surface soil and sub-soil should therefore be of a loose pliable character. Heavy clay soils produce mal-shaped roots, and in wet, badly drained land the roots are liable to rot before reaching maturity. Excess of water at any period of the growing season is highly injurious.

Owing to the advisability of growing chicory on a light soil it would appear that in Rhodesia there may be possibilities for this crop throughout the granite country and also on the more rarely occurring sandstone formation. Much of this land would probably be too poor unless enriched by manure, but manuring for root crops and so obtaining an increased yield from a small acreage is always to be recommended.

Manures.—Farm yard or kraal manure is usually considered the best fertiliser for chicory, more particularly short, well-rotted manure. A fair amount of lime in the soil is preferable, but good crops are often grown where lime is comparatively lacking. As with most root crops a complete dressing, which supplies nitrates, phosphates and potash, will usually give the best results. On poor granite soils twelve or fifteen tons of kraal manure might be applied per acre, but a heavier land six to eight tons should be sufficient. To the former a light dressing of artificial fertiliser supplying phosphates and potash might be added, and the crop could probably be grown with advantage the second year after potatoes, the manures having been applied to the latter crop.

Tillage.—Deep ploughing is the first essential of successful chicory growing. The land should be stirred to a depth of at least ten inches, and deeper if possible, especially where a hard subsoil is present. After ploughing, the soil should be deeply cultivated. A grubber or Marten cultivator is very suitable for this purpose. Finally, a fine surface tilth should be obtained for the seed bed, but on soils which are liable to "cake" after rain the surface mulch is better left a little more coarse.

Sowing.—Chicory seed is comparatively small, but if of good quality germinates readily and the young plants are hardy against sun-scorch. The crop should be drilled in rows from fifteen to twenty inches apart; about two pounds of seed being required per acre. A small hand planter, such as the Iron Age or Planet Junior, is suitable where small acreages are grown, and these if made with hoe attachment can be utilised for after-cultivation between the rows. When the seedlings are well established the rows should be thinned out so that the plants stand about four to six inches distant in the drills. Transplanting these seedlings to fill in blanks as is done with other root crops is not usually successful.

The date of growing is governed to a great extent by the locality. The crop requires from five to six months to mature, and should have the heaviest rainfall during the earlier stages of growth. As a general rule growing from the end of November to the end of December appears the most suitable time.

As with all crops, the best seed is the cheapest, and first-quality chicory seed should conform to a germination test of 85 per cent., and a purity test of 90 per cent.

After Cultivation.—Thorough cultivation is necessary the whole time the crop is in the ground both to suppress weeds and to keep the surface soil free from packing. The deeper this cultivation can be made without injuring the roots the better. During the early stages of growth and before singling a hallick weeder can often be used with advantage, but later cultivation can best be done with a mule and a single cultivator or horse hoe. Some growers prefer to space the rows only twelve inches apart, and in this case after cultivation must, of course, be done by hand.

Harvesting.—The crop should be ripe about five to six months after planting, and ripeness is indicated by the root breaking with a clean fracture and being comparatively free from milky juice. Occasionally a few plants will run to seed, but as soon as possible the seed stalks should be cut down. If permitted to seed the quality of the root is impaired. As maturity approaches the lower leaves begin to turn yellow and, if possible, the crop should be lifted before frosts are general. Continual freezing or thawing injures the root. The cost of lifting the roots is one of the main items in chicory production. This is usually done either by hand or by running a mould board plough along the outside of the rows and so exposing the roots on one side. Care should be taken not to break the roots when lifting as is easily done in tenacious soil.

Markets.—When the grower is in the vicinity of the chicory factory the roots are usually sold fresh or green and will be worth about £2 10s. a ton. In Rhodesia at present there is no such factory, and roots must therefore be sun cured before despatching to market. This process is as follows: After lifting the tops are twisted off, and the roots are then cut into sections about half an inch thick. This cutting can be done by hand, or an ordinary root chopper could probably be adjusted to make the required cut. The sections are then laid out on a drying floor of stamped earth or other material, and exposed to the sun for about a fortnight to three weeks, by which time the produce should be quite dry and ready for despatch to the factory. In the process of drying the green roots lose about threequarters of their weight. Harvesting should be done in dry weather, in order that the roots may be clean when lifted.

The railway rates on chicory from Salisbury to Durban are, for fifteen ton lots or over, £5 2s. 8¼d. per ton, and in five ton lots, but under fifteen tons, £6 1s. 2½d. per ton.

As has already been pointed out, the demand for chicory is limited, but where factories are working they require to be assured of a regular supply, and the crop appears to offer some inducement to agricultural farmers who have suitable soil. Before planting largely, however, prospective growers would do well to communicate with local manufacturers and arrange for the sale of their crop when it is grown.

Extracts from the Annual Report

OF THE

Department of Agriculture

AND THE

Veterinary Department.

Since the Blue Book, in which the reports are presented to the Legislative Council, is not readily accessible to farmers, the following extracts are published for general information :

Signs of Progress.—The progress of agriculture, which was so marked in 1909, has been fully maintained. The agricultural progress of Rhodesia is not to be measured by her export lists, as happily the market for most products grown is within the country and keeps pace, except in the case of mealies, with production. In this respect the difficulty of the farmers is not in the production itself, but in the assurance of a market at reasonable prices, the demand by mines and prospectors for boys' food, meat, potatoes, pumpkins, sweet potatoes, beans, ground-nuts, onions and the like being still of an erratic and unreliable character. A better means of measuring progress is found in the number of homesteads, and in the figures representing the importations of agricultural implements, fencing material, breeding stock and the prices given for land. A recent return, prepared from official sources, gives the following figures for the actually and beneficially occupied farms, and, since it was prepared a few months ago, there are no doubt many additions, as the influx of farmers has been continuous :—

Mashonaland	...	...	990
Matabeleland	...	...	480
			1,470

In considering these figures it must be borne in mind that the average farmer in Rhodesia is a man of substance, and often of experience and education as well, and that the great majority of these are within 30 miles of the railway, though some are 120 miles from a station.

Noticeable features of native cultivation are the extension of the use of the plough, especially the old favourite for

pioneer work known as the "75," and the demand that has arisen for donkeys. These developments are more pronounced in Matabeleland than in the other Province.

In earlier days, even within the last four or five years, many of the comforts, and even the ordinary necessities of life which can supply, were denied to the miner and other residents in outlying parts. Now these commodities, and even luxuries as well, are reasonably cheap and abundant. The pioneer settler is too concerned with the essential problems of existence, food and shelter, to give time and attention to *la petite culture* and to the by-products of farming, but soon after the first needs have been met, and when leisure allows, the amenities of life are sought for home use and for sale. The advance as is but natural, has been most manifest in the regions within reach of the railway, and outlying parts, such as Melssetter and Victoria, have little progress to record. Such areas are, to a great extent, cut off, and when the small local requirements are met there is no market for surplus. To the dwellers in these parts the advent of the railway appears as the millenium, much to be desired and equally elusive. Until these outer regions are given easy and rapid communication with the outer world, serious development is not to be expected. The oft-debated problem arises of the settler preceding the railway or *vice versa*. The settler would willingly go first, provided there was certainty of the railway following within a reasonable time.

The list of our exports is not without significance of the progress of the country, especially when compared with the corresponding figures for last year. The following table, though not exhaustive, comprises our principal agricultural exports:—

EXPORTS FROM SOUTHERN RHODESIA.

	1910		1909	
	Quantity. lbs.	Value. £	Quantity. lbs.	Value. £
Hides, ox and cow ...	208,699	7,292	151,765	4,908
Skins, sheep and goat...	136,038	4,413	85,563	2,804
Kaffir Corn ...	1,174,261	3,103	1,413,473	4,090
Onions ...	37,948	319	41,123	345
Tobacco (unmanufactured)	322,334	28,028	190,822	11,002
Wood (cubic feet) ...	10,082	2,519	—	947
Mealies ...	5,911,123	11,973	2,288,453	6,023

The increase in the export of hides and skins is an index of increased consumption of locally-killed meat, as there is no tannery yet in the country to disturb this return, and the increase is a very substantial one. Kaffir corn is native grown, and the reduced figure is probably only due to the substitution by the natives of maize for the old-fashioned cereals. The small export of onions is of no moment. Tobacco is nearly double in quantity and much more than double in value, and this refers really to the previous year's crop in each case, as the public auction of leaf from the warehouse which controls this figure takes place in January of the year following that in which it was grown. The increase in export of timber is satisfactory, as this is entirely wood of high value per cubic foot, sent to the Transvaal for cabinet work and other special purposes.

Crops Other than Maize.—Whilst maize has hitherto been, and is likely to remain, in point of acreage the principal European crop in Rhodesia, many others are being grown. It is a feature of the present state of our agriculture that a new interest is being displayed in the possibilities of other crops and in the end of adding variety to the productions of the farm. The problem is complicated, and must be considered from the various standpoints of the crop suited to the soil, the crop which can, when produced, be disposed of or utilised on the farm to good advantage, the season of growth, the cost of production, the labour involved, diseases, transport, preparation for market, relative profit and kindred questions, on a satisfactory solution of any one of which success or the contrary depends. Experiments are throwing light on these points, and there is reason to anticipate that the next few years will see a material change in this respect and several notable additions to our staple crops.

Linseed has now amply proved its suitability in this country, especially on our strong soils. It grows readily and yields well, and has so far proved very profitable. A critical period has now been reached, for many farmers are growing linseed, but each on such a small scale that the total output seems hardly sufficient to attract commercial interest. Moreover, unless grown on a large acreage, economies in harvesting and threshing cannot be advantageously applied. With most crops of this description a stage is reached when the grower

waits to be assured of his market, and the buyer desires first to see production on a large scale before opening up a trade or putting down machinery to deal with big quantities. In the case of linseed we have a double possibility, for, besides the value of oil and cake, we have a potential fibre industry. Other crops which are in the same stage at present are ground-nuts, broom-corn and Mauritius hemp, whilst tobacco may be said to have recently emerged from that condition. There is reason to believe that a factory to express oil would not be long in being established when supplies warrant it.

Ground-Nuts.—The demand for ground-nuts in Rhodesia far outweighs present supplies from both European and native sources, and large quantities of this useful food are imported for consumption on the mines. There is no reason for this, save the scarcity of labour to handle this crop. The difficulty may be got over by the use of machinery, cheapening the cost of harvesting and by extending the cultivation of ground-nuts on our lighter classes of soil, many of which are admirably adapted thereto. Farmers are apt to overlook the indirect advantage of such a crop for the purposes of rotation, as a soil improver and a useful fodder after the removal of the nuts. There is a good prospect, if only larger quantities were available, that factories will establish themselves for oil extraction and soap boiling.

The Small Cereals.—Special attention has been devoted to wheat, oats and barley grown as winter crops without irrigation on naturally moist soils, and also as late summer crops, maturing after the rains are past, in which case the prime essentials are rust resistance and rapidity of maturation. There is reason to anticipate, in the early future, a greatly enhanced production of these grains, especially in the districts of Charter, Marandellas, Mrewa and Melsetter. Wheat enjoys a natural protection, due to distance from other wheat-growing regions, and as long as the production remains at all below the requirement, the crop must be a very profitable one. Samples of barley have elicited high praise from the maltster, for which our abundant sunshine is no doubt responsible, and, with local breweries and a ready South African demand, there should be little difficulty in disposing of this crop if grown in adequate quantities for the breweries' requirements. With oathay at 7s. per 100 lbs., the profitability of this crop is beyond question.

Tobacco already occupies a position of importance amongst our crops. At the commencement of the year, a sale of the previous season's crop of Virginian tobacco, prepared at the warehouse in Salisbury, was held and attracted buyers from the south, 100,000 lbs. of leaf being sold at the satisfactory average price of 1s. 2d. per lb., the top price of 2s. 4½d. being paid by Messrs. Herman & Canard, of Capetown, for exceptionally bright leaf grown by Mr. Deall, of Umtali. Although too late in the season to affect the acreage for 1910, the very satisfactory results obtained could not but draw increased attention to tobacco culture, and to the reward attached to proper care in the growth and curing of the leaf.* The demand has been keen throughout the year for Rhodesian leaf, and the prospects of the industry are good, provided adequate supplies of labour, of which relatively large quantities necessary, are forthcoming. An important event was the transfer of the tobacco warehouses, and experts attached to them, from the Commercial Branch of the British South African Company to the Tobacco Company of Rhodesia and South Africa, Limited, formed to carry on the manufacturing of Rhodesian tobacco. This step was watched with critical interest, amounting to suspicion, by growers and manufacturers alike, but the policy pursued by the company since its inception is successfully overcoming these prejudices. The new company bids fair to be a potent factor in the development of the tobacco industry, and may yet exert a powerful influence for good in the country. The formation of a Tobacco Planters' Association is a step on the part of the growers which is to be welcomed. Such an organisation, representing the interests of the growers and focussing their opinions, cannot but be of service in dissipating the misunderstandings which but too readily arise concerning the attitude of buyers and manufacturers and the prospects of the industry. Through the instrumentality of this association, an agreement has been arrived at, as the result of a conference at which all interests were fully represented, in respect of next year's crop of Virginia leaf. Buyers on the one hand will abstain from purchasing tobacco privately, and only buy at the public

* The 1910 crop, disposed of them in January, 1911, fetched the high average price of 1s. 4½d. per lb. with a top price of 3s.

auction held under the auspices of the Salisbury Tobacco Warehouse, while growers have pledged themselves in a similar way not to dispose of their crops privately, but only through the annual public auction sale. This amicable arrangement disposes effectively of difficulties which, though largely imaginary, none the less effectually discouraged planters, and created a feeling of anxiety amongst manufacturers, to whom it is essential that they shall be assured of at least a fair opportunity of replenishing their stocks of Rhodesian tobacco, for which they exhibit a most lively desire. A not unnatural consequence of these practical steps and the encouraging outlook is the extension of the area under tobacco and of the number of growers. The qualities that render Rhodesian tobacco especially desirable in the eyes of manufacturers appear to be its excellent burning properties and bright colour. The former seems innate where leaf is grown on proper soil, so it is to the latter point that the efforts of growers must be especially directed.

Farmers' Associations.—The Farmers' Associations have increased during the year to 25, and constitute a not unimportant factor in our agricultural organisation, capable of considerable development in the future. Besides the usual grant-in-aid, the Government furnished funds necessary to enable delegates representing the Rhodesia Agricultural Union to attend the Inter-Colonial Agricultural Congress, which held its meetings at Capetown during November. The presence of delegates from Rhodesia was warmly appreciated by the Union members, whilst our representatives profited much by the opportunity of coming in contact under such interesting circumstances with leading agriculturists from other parts of South Africa.

The Number of Cattle.—An estimate based on official figures shews that the native-owned cattle in Rhodesia number not less than 261,000, but precise figures are not obtainable. Cattle owned by Europeans may be estimated at 110,000 head. A conservative computation therefore is 371,000, and the natural increase for the coming year may be set down at about 100,000 head. The forthcoming census will furnish more exact figures, but on the above assumption this represents a stocking of 2·5 per square mile, or less than one head to 200 acres. There is room therefore for many times more cattle

than we at present have in the country, for thin veld should carry one beast to 20 acres, while on better land, of which there is an abundance, half the area should easily support a beast, and with winter feeding and artificial fattening of slaughter stock, such as is the rule elsewhere, the numbers can be indefinitely increased.

Meat Supply.—The notable increase of population has led to a corresponding consumption of meat, and the importations of fresh, frozen and preserved meats, including bacon and ham, shew an increase from two million lbs. to two and three-quarter million lbs. (2,757,755 lbs. in 1910 and 2,034,347 in 1909). Against this may be set the reduction in the number of sheep and goats imported by 10,000 head or about 400,000 lbs. of mutton. Local supplies are increasing, but not in proportion to the demand, and butchers forecast a shortage of beef and further increases in price at no distant date.

Importation of Live Stock.—Customs returns shew total importations into Southern Rhodesia of 3,240 head of cattle during 1910. as against 13,859 in 1909. This notable diminution is explained by the fact that, after prolonged prohibition, cattle were in 1909 admitted from North-Western Rhodesia, when a large influx took place. Owing to the alarming reports of anthrax, no stock was admitted from North-Western Rhodesia until the last three months of the year. In order to admit cattle, but at the same time to safeguard the Territory from anthrax and from fly-borne diseases, arrangements were made for the introduction from North-Eastern Rhodesia and Nyasaland into Southern Rhodesia of cattle, cows and oxen, through Feira as a port of entry, into quarantine areas which have been set apart for their reception above the escarpment, near Sipolilo. Strict regulations have been framed regarding veterinary inspection, and movements are only allowed from clean areas and along healthy routes, which, with quarantine on arrival, sufficiently protects the safety of this country. The introduction of cows and heifers is an especial advantage, as our supply of breeding stock is inadequate to meet the demand, and in a measure compensates for the competitive supply of slaughter oxen brought in, which find a market mainly on the mines. Similar facilities have been accorded to North-Western Rhodesia, cattle being admitted by rail to quarantine areas, but that Administration has prohibited the

export of female stock, and permits only oxen to be sent down. This constitutes a hardship on those, white and native, who have purchased or own breeding stock north of the Zambesi and desire to bring it into this territory. Southern Rhodesia thus furnishes a market for slaughter oxen from North-Western Rhodesia, but derives no breeding stock from that source.

The system of control introduced in the previous year for the prevention of the introduction into Rhodesia of possibly lung-sick animals from the Cape and the Orange Free State continues to work satisfactorily, although regarded by exporters in the south as severe to the extent of being prohibitive. During the period under review some 250 head were rejected by our Inspector of Stock in the Cape and Orange Free State Provinces. The scheme for the purchase of stud stock on behalf of farmers continues to work satisfactorily. During the year, animals to the value of £1,870 were obtained, including 19 bulls, 77 heifers, 186 sheep and 10 pigs. An increasing desire to take advantage of these facilities is manifest, and the selections made by our representative, Mr. Woodlin, have given general satisfaction to buyers. All preliminary steps have been taken for putting into effect a scheme for the purchase of about 80 head, comprising bulls and heifers of the Shorthorn, Sussex and Hereford breeds, to be imported from England, inoculated under veterinary supervision, and acclimatised at the Government farm, Gwibi, the bulls to be ultimately sold and the female stock retained for breeding purposes, and for the perpetuation of the supply of pure bulls bred in Rhodesia. Unfortunately, the project has been suspended, owing to anxiety felt regarding the spread of African Coast Fever. It is hoped that the proposal may yet, ere long, be realised. Importations of horses, mules and donkeys shew an increase over last year—2,853 being recorded for 1910 as against 2,438 in 1909, whilst the importation of sheep and goats, mainly brought in for slaughter purposes, shews a material falling off from 42,329 to 32,577.

The annual supplements to the Brand Directory are published regularly.

Dipping Tanks.—There are now approximately 100 tanks, in use or in course of construction, which have received

Government aid, while a very few others have been built without resort to the grant. Of these, 77 are private dipping tanks, and 23 were built by the Government for public use. During the year the pattern employed by the Government for its own use has been modified and improved to meet our requirements, and specially designed to require a minimum of cement, owing to the extremely high price of that article in this country. Consideration has been given to portable forms of spraying and dipping appliances which have appeared and been offered by manufacturers, but it has not appeared desirable to afford them the same support that is given to the construction of durable concrete tanks. Grants-in-aid for the erection of dipping tanks are being freely applied for. Since the 1st January, 30 applications have been granted, which goes beyond the limits of the vote set apart for this purpose, but the benefit such tanks confer on the public, as well as the owners, amply justifies this excess. The charges hitherto levied for the use of public dipping tanks have been abolished, removing any occasion for neglect of this very necessary precaution.

Dairying.—Considerable expansion has occurred in the dairying industry, both in the fresh milk trade and in a more regular local butter supply. This is due to the growth of a stable and more reliable demand, together with a greater attention to the feeding of cows for dairy purposes with food specially grown for them, and to the greater care paid to milking cattle. Much remains, however to be learnt regarding the handling of milk and dairy products, and the organisation of the industry on proper lines. The time seems close at hand when the manufacture of butter on factory lines, co-operative or otherwise, is inevitable, the raw product—milk—becoming more and more plentiful, while the figures regarding importation are eloquent testimony to the opportunities which exist in this direction.

Hydrology.—Although favoured with ample general rainfall, and not subject to severe drought, Southern Rhodesia yet offers good scope for profitable application of the methods of irrigation to farming. The rainy season is clearly defined, and from May to September inclusive the precipitation is not of itself sufficient to enable crops to mature, for which otherwise the climatic conditions are at that time suitable. On

naturally moist vleis, wheat, oats, barley, rye and other crops do well during the moist season, but land so situated is of limited extent. These crops have a high value in this country. Vegetable food is much needed during the winter as an anti-scorbutic diet on the mines. For dairy cows, and indeed all stock succulent feed is invaluable when the natural pasture is dry. Much benefit must therefore result from an increase of irrigation. Realisation of these facts led to the appointment of an Agricultural Engineer, who commenced his duties on 20th July, 1910, since when he has carried out a detailed reconnaissance of portions of Mazoe and Umrodzi river valleys, as a result of which he is in a position to recommend schemes affecting 3,000 acres of irrigable land. Other large schemes were inspected on the Sebakwe and Ngesi rivers, and preliminary reports furnished which hold out hopeful prospects. The Engineer also inspected, before the end of the year, 52 private irrigation schemes, furnishing general advice, or setting out dams and giving levels for furrows. Eleven proposals were condemned, but in the remaining 41 cases feasible undertakings were found and recommended. The distribution of these projects is as follows:—

District.	Cases.	Approximate Irrigable Area.
Victoria	11	250 acres.
Belingwe	10	65 „
Gwelo	7	15 „
Goromonzi	3	40 „
Mazoe	17	210 „
Charter	6	70 „
Totals	51	650 acres.

Irrigation in Southern Rhodesia seems likely for the present mainly to be developed through the extension of small and private works, for which there appear to be great possibilities and encouraging prospects. The demand for the Engineer's services, and since his visits the appreciation of the work done, have amply justified the creation of this post.

Forestry.—By special request, Mr. J. Sim, District Forest Officer, Kingwilliamstown, was seconded from the Union Forest Department for the purpose of inspecting the natural

forests of Rhodesia, and reporting upon the possibilities of preserving and utilising them and of afforestation. Mr. Sim spent four months examining types of the various classes of natural forest and plantations, at the end of which time he furnished a detailed and instructive report of high value, extracts of which have been published in the "Rhodesia Agricultural Journal." The problems Mr. Sim was called upon to consider are momentous and complicated. Not only have immediate needs and present conditions to be considered, but also the requirements of the future. Wood is so essential, so irreplaceable by substitutes, and takes so long to produce, that the problem of provision for a distant future has to be considered now—should indeed have been taken up years ago. Regarding the use of wood, there appear to be two extreme views, and truth probably lies midway. Some consider the removal of native timber, even of scrub, in the bush veld, as of the nature of sacrilege, to be followed ere long by a change in our climate, a conversion of our veld into a karroo, our rivers into ravines, and our vleis into arid wilderness. Others, again, regard all trees as adjuncts of mining and prospecting, to be taken whenever wanted, without regard to waste involved, or of the future needs of the community, or of regeneration of the areas devastated. Our forests must be exploited to furnish our requirements for mining and other purposes. At the same time they must be conserved with a view to maintaining the supplies through all time, to provide our needs without drawing on the capital, and to increase and improve and cheapen the supply of timber, while safeguarding those other interests of a climatic and hydrographic nature which are of national importance, and which remain for all time. These ends can only be achieved by systematic conservation and control, and by adopting silvicultural methods in place of the present ruthless, haphazard and wasteful ways. The recommendations made by Mr. Sim to this end will receive the most earnest consideration.

Fencing.—The area in which, at the request of the farming inhabitants, the "Fencing Ordinance, 1904," is put in active operation has been increased from 870 square miles to 2,523 square miles, districts round Salisbury and round Plumtree having adopted the measure, which provides that, where a

farmer erects a fence on his boundary, he may call upon his neighbours to share in the cost. The measure is only applicable in practice in areas which are fully occupied by farmers who own the land they work, and these are often diffident in incurring pecuniary obligations which bring them in only an indirect benefit, however great and real it may be. Experience has shewn the law of 1904 to be cumbrous in practice, and means of simplifying it are under consideration. Advantage is being increasingly taken of the facilities afforded to farmers to enclose their land, either by boundary fences or sub-division into paddocks. The terms on which loans are made have been extended, and latterly a number of applications for loans have been received, £2,520 having been granted during the course of the year. It is surprising how, with African Coast Fever at their doors, farmers can delay to make use of what is recognised as the best safeguard, especially when such easy terms of repayment are offered. The Railways are offering favourable terms to farmers willing to fence along the line, thereby also shewing their practical sympathy with the aims of general fencing.

AFRICAN COAST FEVER.—It has been suggested that some of the recent outbreaks have been due to the persistence of infection over several years without being recognised—that probably a calf or two died at long intervals, just sufficient to keep infection alive and ultimately result in great infection of the herd. I think the general experience is that, once the infection is established on any area where susceptible cattle are depastured, it very quickly manifests itself by attacking a large number of cattle; and, when the calf kraal becomes infected, the disease very quickly goes through the lot. Many instances can be quoted of small herds of salted cows where for several years all the calves died within three months of birth. That infection can linger on a farm or at a kraal for seven years without manifesting itself, as at Crocodile Valley, where the herd had naturally increased from a few remnants to nearly 200 head, is, in my opinion, impossible.

A more feasible explanation of the increase in the number of outbreaks during the past year, or of outbreaks in which the source of infection could not be traced, is, in my opinion, the existence of infection at some centre or centres where Coast fever has never been known or suspected. It is well

known that on infected areas infection may be kept alive for an indefinite period by calves born from salted or immune parents. Amongst many such cases, the Salisbury commonage is a striking example; in it there were several herds of dairy cattle, mostly salted, or perhaps it is better to say that they were able to live on infected veld without contracting the disease. For several years the calves of these herds died within a few months of birth, and it was not until regulations providing for the enclosure of all calves in clean stables or kraals, until they could be moved to clean veld, that the disease was completely eradicated. It is quite possible that when the disease first went through the country some small herds in isolated situations contracted the disease and died out until only a few animals were left. Calves from these would contract the disease every year, the majority would succumb, and an odd one, perhaps, recover. The veld and kraals would remain infected, the latter chiefly because young calves, as a rule, do not run with their dams during the first few months after birth. Adult cattle could be removed from such herds without carrying infection, but susceptible cattle passing over the area, perhaps by some trader driving cattle from kraal to kraal, to obtain sufficient to take to market, would contract the disease, move on, and not develop any symptoms of illness for 14 to 20 days, thus causing a fresh centre of infection many miles distant from the original unknown and unsuspected centre. During the last few years the demand for cattle has been so heavy that the very remotest parts of the Territory have been visited by the agents of cattle dealers and speculators, and one of these may unwittingly have been the cause of fresh outbreaks in districts which have been clean for years.

The diagnosis of Coast Fever in the first case in an outbreak is a matter of great difficulty and responsibility, and it appears to me that in some instances a positive diagnosis cannot be made because of the absence of definite *post-mortem* appearances, and the absence of piroplasma and Koch's bodies in blood, spleen and gland smears, or perhaps the existence of parasites, but so infrequent and non-characteristic as to prevent the expression of a definite opinion. This difficulty is well illustrated by a herd of cattle on the farm Homefield, in the Salisbury district. Owing to the proximity

of infected veld, this herd was kept under constant observation, and on the 13th of October smears were sent in from an ox shewing high temperature; microscopical examination shewed a few intracorpuseular parasites, sufficient only to justify the opinion as being suspicious of Coast Fever. Daily examination of this and two other animals shewing fever failed to shew anything more definite; two of the animals recovered, the third one died, but *post-mortem* examination was equally unsatisfactory. It was not until the 5th December that smears from another ox definitely shewed the existence of Coast Fever. Several similar instances can be quoted, and although it may be said that in the absence of definite lesions such cases cannot be regarded as Coast Fever, I am strongly of the opinion that they are. Another difficulty in connection with the diagnosis of Coast Fever, and one which unfortunately prevents in some cases the successful removal of cattle from infected to clean veld, is a sub-acute form of the disease, in which no distinct rise of temperature is shewn. Several such cases have been observed on the high veld in the Inyanga district. The *post-mortem* and microscopic examination demonstrated the presence of Coast Fever.

The mortality during the year from Coast Fever was approximately:—

Umzingwani	...	...	153
Salisbury	...	...	24
Melsetter	...	...	4
Inyanga	...	...	58
Makoni	...	...	108
<hr/>			
Total	...	...	347

Trypanosomiasis.—The mortality from this disease has, especially in the Hartley district, shewn a marked decrease. Whether such decrease is due to the effects of the suspension of the game laws or not, I am not prepared to discuss here, but an effort will be made to obtain further information from members of the staff and residents in the affected districts.

Glanders.—After three years' freedom from this disease, I regret to report that nine outbreaks occurred, as follows:—

Bulawayo	...	...	2
Umzingwani	...	...	1
Insiza	...	...	1
Salisbury	...	...	3
Lomagundi	...	...	2

Eleven visibly affected animals died or were destroyed. All in-contact horses and mules were tested with mallein; twelve reacted and were destroyed. In Bulawayo, the first case occurred in March, the affected animal had been imported about five months previously, and was tested with mallein on arrival, as all imported equines are. The animal was, no doubt, infected on arrival, and either failed to react to the mallein test or the reaction passed unobserved. The outbreaks which occurred subsequently at Umsingwani and Insiza can be traced to this case. In Mashonaland, the first case was discovered in the Lomagundi district. The affected animal had been purchased a short time previously from a dealer in Salisbury. On examining the animals in his stable, two horses showed symptoms suspicious of glanders, both reacted to mallein and were destroyed. [Outbreaks occurred in two other stables in Salisbury; these were most likely due to the stable referred to. In 1899 glanders was very prevalent in Rhodesia, but it was successfully eradicated by the general application of the mallein test. Since then we have been able to prevent its re-introduction by testing all horses, mules and donkeys on importation and destroying every animal that reacted. The outbreaks now reported are therefore unsatisfactory, and shew that there has been a defect somewhere—whether in the mallein itself or failure to observe reactions I cannot say—but every effort will be made to prevent the disease being again introduced.

During the year the following animals were tested on importation:—

Horses ...	...	...	1,114
Mules ...	...	...	2,037
Donkeys	...	...	2,252

Thirteen horses and four mules reacted and were destroyed. Of these, twelve horses and one mule belonged to one consignment from the Orange Free State. The Veterinary Department, Bloemfontein, was communicated with, and on enquiry it was found that all the animals except one had come from Basutoland. I am informed that the greatest pains were taken to discover glanders in the localities where these animals had been, but no trace whatever could be found. No doubt most of the animals contracted the disease during the

five days' railway journey to Bulawayo ; whether from one of the lot being glandered or from a grossly infected truck, it is impossible to say.

Contagious Pleuro-pneumonia (Lung Sickness).—I am again pleased to report that the Territory remains free from this disease.

Rabies.—Five suspected cases of rabies were reported during the year, as compared with ten during the previous year. In only one instance, however, was the existence of the disease definitely ascertained.

Horse Sickness.—The season 1910 was, compared with the preceding one, a mild one.

There has been a steady demand for the inoculation of mules by Dr. Theiler's process. A few cases of inoculated animals contracting horse sickness were reported, but, as usual, it was impossible to obtain accurate information.

Importation of Breeding Stock.—During the year our Inspector of Stock for the Cape and Orange Free State issued permits for the importation of 130 bulls and 1,368 heifers. It is satisfactory to be able to report that all animals arrived in a healthy state, and that only one casualty occurred during the long railway journey.

Insect Friends of the Farmer.

By RUPERT W. JACK, F.E.S., Government Entomologist.

Although they may not directly affect the farmer, the majority of insects are injurious to vegetation in one way or another, and must therefore be regarded as enemies, seeing that they give nothing in return for the injury they do. Some insects are, however, beneficial. This class may be divided into the very few species that produce some substance of direct use to mankind, like the honey bee, the silk worm and the cochineal and lac insects, and those that aid the farmer in making war upon their injurious brethren. We propose to bring to the farmer's notice certain beneficial insects in the latter division which he may previously have regarded from the opposite point of view or most probably never have noticed at all. These insects deserve encouragement, and it may be as well to be able to recognise some of them by sight.

To begin with the most highly developed of the insect kingdom, we find a great number of friends amongst the Hymenoptera, the order which includes the ants, bees, wasps, and a number of stingless parasitic insects allied to the wasps. The ants may be ruled out of our list, as although some species prey upon the Termites or "White Ants," the majority of them are injurious, as they protect the scale insects and plant lice on our cultivated plants, and a number of species are apt to infest our houses and destroy our food. The part played by bees in the fertilization of certain flowers is well known, otherwise they do not come into our discussion, so we arrive at the wasps. Few people have much good to say about a wasp, and yet, as a matter of fact, a great many species are our active allies. Plate I, Fig 6, shows a species of digger wasp which catches flies as food for its young. The specimen figured was taken when apparently trying to catch Tsetse Flies on the coat of a native. Several allied species have a habit of hovering about the flanks of cattle and other animals for the purpose of catching blood-sucking flies. Certain other wasps provision

their nests with caterpillars, some with grasshoppers, some with beetles or their grubs, and others with plant lice. Certain families use spiders for this purpose and so cannot be considered beneficial, as spiders, in spite of the abhorrence with which they fill us, are beneficial from their feeding habits. Plate I, Fig 7, represents a member of a family which stores caterpillars for the young. The wasp's method of procedure is to sting its victim until paralysed, but not dead, and to carry it into the previously prepared hole in the ground or elsewhere. An egg is then laid on the insect and when the wasp's grub hatches it finds a plentiful supply of fresh food at hand which it at once proceeds to devour.

We come next to the wasp-like parasites, and of these there are a number of families which constitute the natural checks on the undue increase of a large number of species of caterpillars, plant lice and scale insects. Many of these parasites seem to confine their attacks to certain hosts, so that the life histories of the two are intimately connected. Plate I, Fig. 5, shows an Ichneumon Fly. It looks rather a formidable insect, and would no doubt be classed as a "hornet" by most people, and ruthlessly destroyed. It is, however, perfectly harmless, and lacks both the will and power to sting, the prolongation of its body being merely the ovipositor or instrument by which its eggs are laid in the body of its host. The majority of the Ichneumons live in caterpillars, but some attack insects of other orders. Plate I, fig. 1, shews an insect (greatly enlarged) belonging to a family closely allied to the Ichneumons. This is a species of the genus *Microgaster* and attacks the caterpillar of the *Citrus Butterfly* (*Papilio demoleus*). The members of this genus cause the numbers of small white cocoons which may be seen attached to the backs of dead or dying caterpillars. Fig 2 shews a caterpillar infested with these cocoons from which the parasites have already escaped. The neat mode of exit is well illustrated. If a colony of Aphides (Plant lice) be examined closely a number of swollen dry skins will usually be seen, frequently pierced with a minute hole. These are parasitized specimens, the hole being the point of emergence of the mature parasite, a minute wasp-like insect. Such a parasite bred from the com-

mon Cabbage Aphis is shewn very greatly enlarged at Plate I, fig. 3. It belongs like the *Microgaster* to the family *Braconidae*. These insects are exceeding beneficial in keeping down the various aphides, which nevertheless from their very heavy rate of increase commonly keep well ahead of the rate of destruction. But for the various checks to which they are subject their numbers would be absolutely overwhelming, in fact they would soon render the earth uninhabitable.

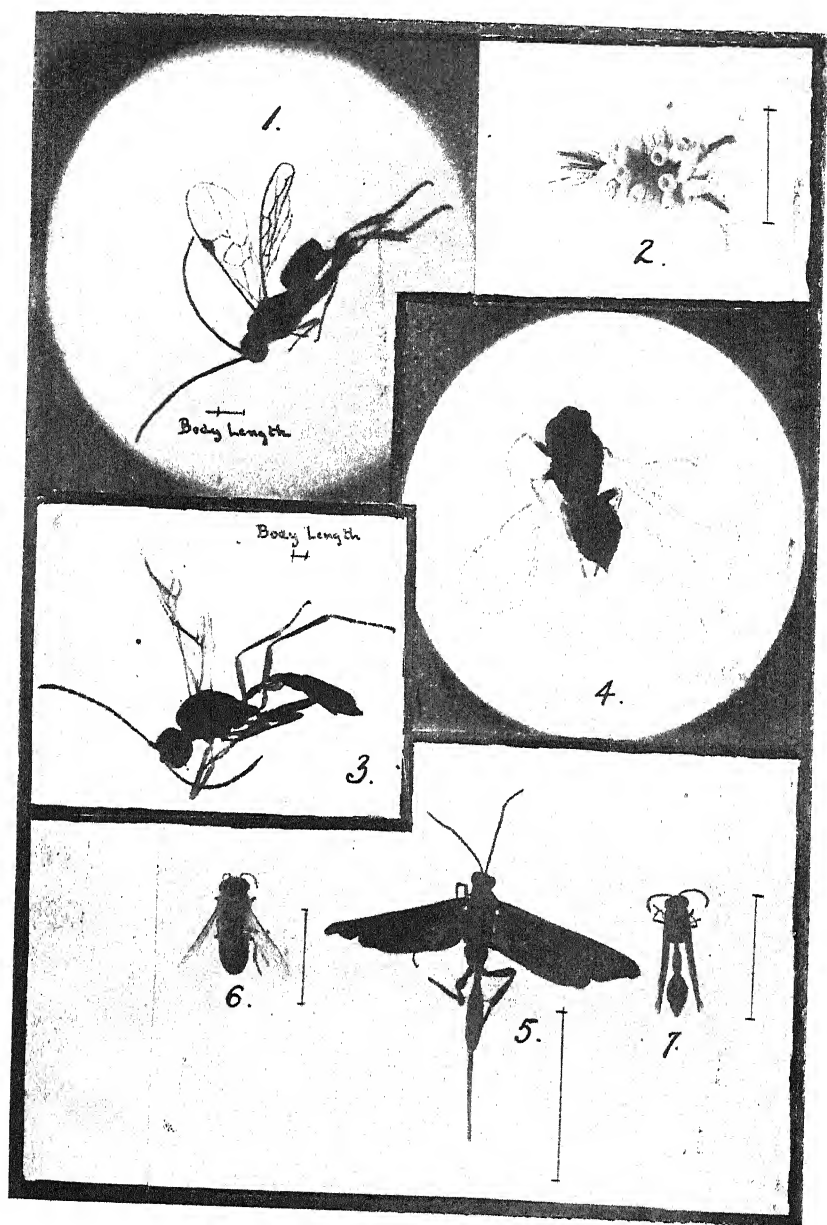
The parasites of the scale insects are naturally very minute insects and need a strong lens to bring them within convenient range of our eyesight. Nearly all scales are subject to the attack of these tiny enemies, and in some instances they constitute an effective check. As an instance of this we may mention the case of the *Black Scale* (*Lecanium oleæ*). At the Cape this a common scale on Oleander, Myoporum, etc., but as a pest of fruit trees it is of very little importance owing to its parasites. In certain parts of North America this scale was one of the worst enemies of the olive and citrus trees. The most abundant species of parasite at the Cape, namely *Scutellista cyanea*, was introduced into California with very beneficial results. When the parasite emerges from the scale it eats a little circular hole through the body wall of the scale and the waxy covering. Numbers of dead scales perforated in this manner may frequently be seen by examining infested branches with a lens. Plate I, Fig. 4, shews an adult parasite bred from the *Soft or Brown Scale* (*Lecanium hesperidum*). In actual size the insect is little more than a dot. Some members of the *Chalcididae* are of service in fertilizing figs. The best known of these is *Blastophaga grossorum*, which fertilises the Smyrna Fig, and has been introduced into various parts of the world, including South Africa, for this purpose. Without this insect the fruit of the Smyrna Fig fails to ripen.

Our best friends amongst the Beetles are the Ladybirds. Many species of these insects feed upon scale insects. The case of the *Vedalia Ladybird* (*Novius cardinalis*) introduced into America and South Africa to check the ravages of the *Australian Bug* (*Icerya purchasi*) is well known to all. It is doubtful, however, whether the Australian Bug would not have succumbed to the attack of our native species, generally referred to as the *Rodolia* ladybird. This appears to be the

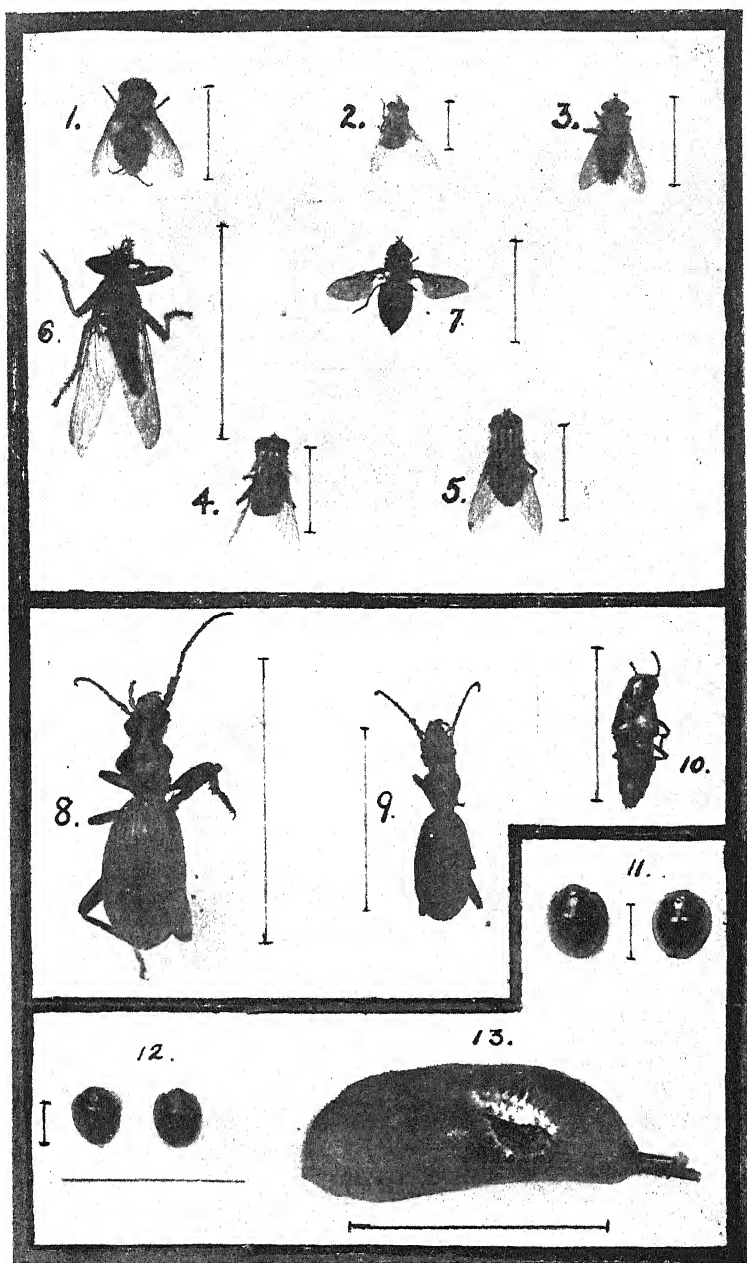
species that keeps the scale within reasonable bounds in Rhodesia at present. The famous *Mammoth* or "*Kopje*" *Scale* that created so much interest in Salisbury in 1907, is very severely attacked by the *Rodolia* ladybird and another species, *Chilocorus distigma*, and these seem to be the normal checks on the scale which would otherwise be more than a sporadic pest. The *Rodolia* ladybird is usually reddish with a brownish smudge down each wing cover, but the coloration is rather variable. The back is covered with minute grey hairs which gives the insect a dusty appearance. (See Plate 2, Fig. 12). The *Twin Spot Ladybird* (*C. distigma*) is shiny black with an orange spot on each wing cover. It is rather larger than the *Rodolia* (see Plate 2, Fig. 11). Both these species feed on many species of scale, including the Red Scale, both in the grub and adult stages. Besides scale insects ladybirds feed on the aphides (plant lice) and injurious mites with attack plants. The grubs of the different species vary much in form. Some are reddish and nearly naked, others have a woolly appearance. In some species, *Rodolia* and *Chilocorus* for instance, the pupæ (chrysalides) can be seen attached to the stems and leaves near the scale, the pupa being enclosed in the skin of the grub, split at one end, but not discarded (Plate 2, Fig. 13). Certain ladybirds belonging to the genus *Epilachna*, feed on plants and so are harmful. They are mostly yellow and black. We have several species of these plant-eating ladybirds in this country.

The *Tiger Beetles* (*Cicindelidae*) and the *Ground Beetles* (*Carabidae*) are actively carnivorous. The former are commoner about waste places, whilst the latter occur almost anywhere. The grubs of the *Tiger Beetle* live in burrows, and waiting at the entrance for their prey, capture insects that alight near them. The grubs of the *Ground Beetles* are active and predatory. A *Ground Beetle* is shown at Plate 2, Fig. 8, and a *Tiger Beetle* at Fig. 9.

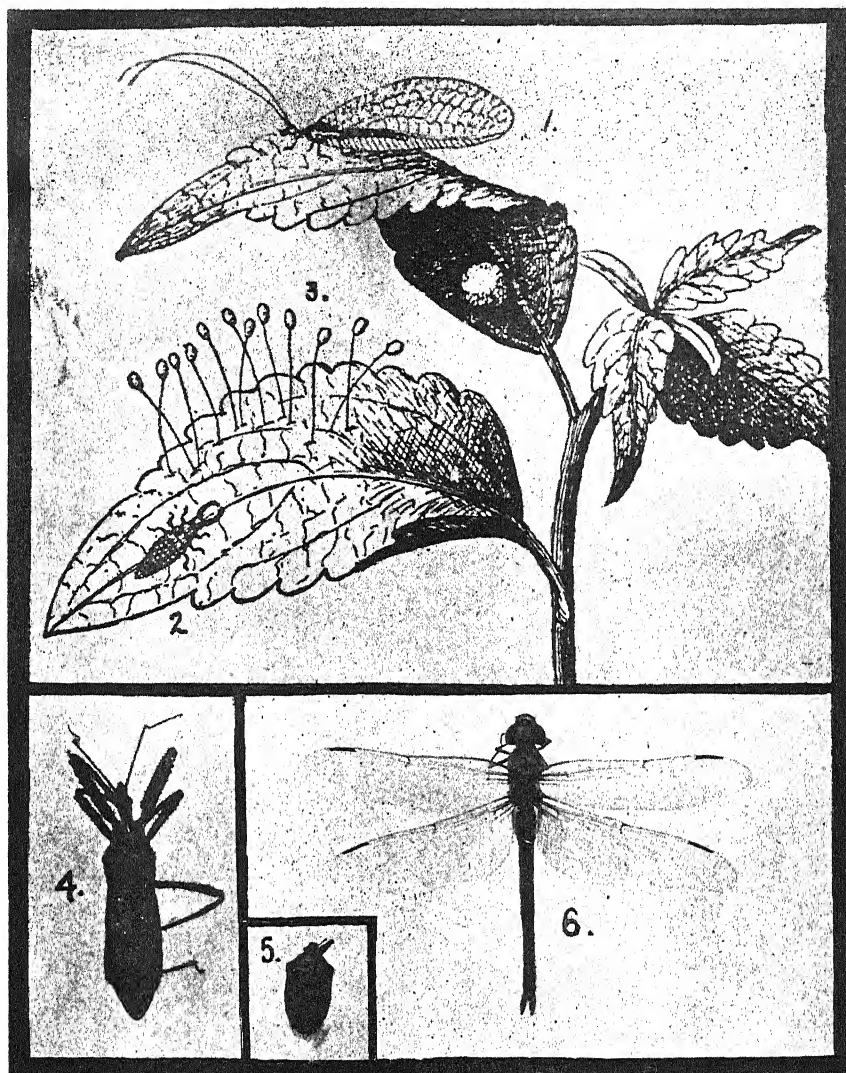
Certain members of the *Staphylinidae* or *Rove Beetles* prey upon maggots, and in Brazil at least one species is said to be very partial to the young *Fruit Fly*. This beetle was introduced into Natal in 1905, but the writer is unaware if it has become naturalised. Even if it has it is not likely to prove of much benefit, as *Fruit Flies* are abundant and destructive



Insect Friends of the Farmer. Plate I



Insect Friends of the Farmer. Plate II.



Insect Friends of the Farmer. Plate III.

Body Lengths

1, 2, 3, Reproduction (enlarged).

4

5

6

even in its native land. Other members of this family devour the young of ants, whilst others devour the maggots of flies in decaying carcases. An illustration shewing the characteristic appearance of a Rove Beetle appears at Plate 2, fig. 10, but this is an exceptionally large species. The shortness of the wing covers should be noticed. Certain other families of beetles are predaceous upon weaker insects, but need not be mentioned here. The dung rollers and their allies act as scavengers, and may be considered beneficial to this limited extent.

The flies (*Diptera*) include many of the worst enemies of mankind, but a few friends are to be found in this order. These belong to the families *Tachinidae*, *Sarcophagidae* and *Dexiidae*, all of which are closely related to one another. Not all the members of these families are beneficial, and some are actively noxious, but a large number of species are parasitic as maggots in the bodies of other insects. The *Tachinidae* mostly attack caterpillars and form an effective check to the undue increase of certain species. Thus the destructive *Antherea tyrrhaea*, a large moth, producing a large greyish hairy caterpillar which sometimes defoliates plantations in South Africa is quite heavily parasitised at times by these flies. The grey *Wattle Caterpillar* (*Haplopacha punctifascia*) so destructive about Bulawayo of late years suffers from these parasites amongst others (see Plate 2, fig. 2), the common *Cutworm* (*Agrotis segetum*) has yielded specimens in our breeding cages (see Plate 2, fig. 1), as also has the *Black Caterpillar Pest* (*Laphygma eximpta*) figured in the April issue of this Journal (Plate 2, fig. 3). In fact few, if any, caterpillars are altogether free from their attacks. The good these flies do in this way is enormous. We have at least one *Sarcophagid* fly, namely *Cynomia pictifascies*, which attacks our swarm locusts (see Plate 2, fig. 4) and kills large numbers of this pest. Another species (Plate 2, fig. 5) was bred out from specimens of the Burrowing cricket, injurious to tobacco, etc., illustrated under Notes from the Agricultural Laboratories in the *Agricultural Journal* for October, 1910. The maggots of the *Dexiidae* are frequently found in beetles. Another family, the *Syrphidae* or Hover Flies, contains many beneficial species the maggots living on *Aphides* (Green Fly, etc.) (Plate 2, fig. 7). The *Hump-backed Flies* (*Phoridae*) are small flies of varied

habits, but the maggots of some are parasitic in certain insects and in snails. One species was found to breed energetically in Ticks in the breeding jars under the writer's care in Capetown. It is, however, a little doubtful if the flies of this family will attack snails, insects or ticks which are in a perfectly healthy condition. *The Robber Flies (Asilidæ)* are often taken for blood suckers, but the only blood they suck is that of other insects, which they capture and hold in their strong spiny legs. Their diet consists of weaker insects of all sorts, and some beneficial ones, such as digger wasps, are frequently devoured, but on the whole they do good by eating large numbers of moths, flies, etc. A species of Robber Fly is shewn at Plate 2, Fig. 6.

At least one South African moth, *Eublemma scatula*, may be included in our list, as the caterpillar has the unusual habit of feeding on scale insects. With this and possibly a few more exceptions, however, the huge order of *Lepidoptera* (Butterflies, Moths and Skippers) comprises species harmful to vegetation.

The various species of *Mantis or Hottentot Gods* are carnivorous in their habits and destroy large numbers of flies, moths, butterflies and other insects. The remaining members of the order which includes *locusts, grasshoppers, stick insects, cockroaches, crickets, etc.*, are of a noxious character.

A few of the true *Bugs* are beneficial from their predatory habits, certain members being very fond of sucking juices from caterpillars. Two immature specimens of an unknown *Pentatomid or Stink Bug* were observed attacking the *Wattle Caterpillars* at Bulawayo in 1909. A smaller species was taken attacking the grubs of a leaf-eating beetle on a plant near to the Matopo Dam (Plate 3, Fig. 5). The majority of the species of this family are, however, considered to be vegetable feeders, and therefore injurious. An allied family known as the *Assassin Bugs* are, however, altogether predatory and destroy numbers of other insects. An assassin bug is shown at Plate 3, Fig. 4.

The order *Neuroptera* contains a mixed collection of insects including *Termites or White Ants, the Book Lice, the Dragon Flies, the May Flies, Lacewings, Antlions* and others which lack common names. Dragon Flies devour other insects and are

exceedingly voracious. They hunt mostly over pools and lakes and take the insects that occur in these situations. They are indiscriminate in what they take and benefit the farmer directly but little. They are, however, known to destroy a great many mosquitoes, hence the name "Mosquito Hawk" sometimes applied to them. The earlier stages of these insects live in stagnant water and are also carnivorous. Doubtless many mosquito larvæ fall victims to their appetites. A dragon fly is figured on Plate 3, Fig. 6. The *Ant Lions* are well-known insects. In dry sandy ground they form little pits in the shape of an inverted cone, and at the bottom of these pits they lurk with the strong curved mandibles only exposed. If a luckless ant or other insect oversteps the edge of the pit it begins to slip down the yielding sides. The dislodged particles of sand rouse the ant lion at the bottom, and it at once begins to throw more sand on to the struggling insect and thus brings it within reach of its jaws. The ant lion itself is the larva. The winged insects commonly invade houses in this country during January and February. The benefit derived by the farmer from the feeding habits of the Ant lions is negligible. An allied family, however, which includes the *Lacewings*, is of much more economic importance as the larvæ feed voraciously upon plant lice and other soft bodied insects. The eggs of the Lacewings are curious from the fact of their being furnished with a comparatively long stalk (see Plate 3, Fig. 3). The larva and adult are shewn on the same plate at Figs. 2 and 1 respectively. The body of the adult is commonly bright green and the eyes of metallic lustre. They are fragile short-lived insects which do not feed in the adult stage.

The study of the parasites and enemies of destructive insects forms an important feature of economic entomology and great hopes have been entertained of finding amongst our insect allies the solution to some difficult problems in the way of combatting certain pests which have defied insecticidal methods up to the present. These hopes were raised by the success of the introduction of the *Vedalia ladybird* into America and South Africa to control the *Australian Bug*. In this case the pest was a native of Australia and there kept in check by the ladybird. The pest was introduced into other countries without its parasite, and by its unchecked increase quickly threatened to do

incalculable damage to orchards and forest plantations. It was an instance of a disturbance of the balance which Nature maintains amongst living things. The introduction of the *Vedalia* restored the balance so that now the Australian Bug is not a pest to be seriously feared. As already mentioned, the introduction of *Scutellista* into California had a checking effect on the increase of the Black Scale. The entomologists of different countries, chiefly Australia, South Africa and the United States, have therefore gone to considerable trouble and expense in introducing the parasites and enemies of pests, but the results have on the whole, been rather disappointing, the introduced insects having either failed to become naturalised, or failed to have any marked effect on the pest they were desired to combat. The unwelcome increase of insects on cultivated plants in many countries seems to indicate that the balance of Nature has been disturbed, and that a natural check to the pest is to be found somewhere in the World in the natural habitat of the insect, before Man by transporting living plants across the sea began to give these pests a wider distribution than they would otherwise have attained. Arguing thus the United States and Australia combined to pay the expenses of an entomologist to travel from country to country seeking parasites for destructive insects, and through this agency parasites for various pests were procured, amongst others an Ichneumen parasite of the Codling Moth from Spain, a Chalcid parasite of the Red Scale from the East, and parasites of the Fruit Fly from South America. All these have been introduced into South Africa. The Red Scale parasite failed to propagate here, and the writer is unaware of any of the Fruit Fly parasites having become naturalized. The Codling Moth parasite was breeding hardly in confinement at the Cape in 1909, and no doubt many colonies have been released in infected orchards, and the insect is probably established by this time. It has already become established in certain parts of the United States, but unfortunately has failed to prove of great benefit. The United States has imported many parasites from Europe, and exchanges of beneficial insects between different countries are now quite common. The results of this work on the whole have been disappointing, though benefit has been reported in a very few instances.

The effect of parasitisation on insects and other animals is to produce an irregular oscillation between periods of abundance and periods of scarcity. The parasites increase overmuch and reduce the hosts to very small numbers. Scarcity of food reduces the numbers of the parasites, and the host insects obtain a start, and for a few years become abundant and destructive until the parasites increase sufficiently to reduce them again. This phenomenon is complicated by seasonal conditions, which may be favourable or otherwise to the hosts, and also by what are known as secondary and tertiary parasites, that is to say, insects that live at the expense of primary parasites, *i.e.*, those that attack the pests themselves. Secondary parasites may also be parasitised by tertiary parasites and these by quaternary parasites. The old rhyme about the fleas will be brought to mind. In this way primary parasites of pests are beneficial, secondary parasites are harmful and tertiary are beneficial. In 1907 Rhodesia had the unenviable distinction of bringing an extraordinary scale insect to the notice of scientists. This is the Mammoth or "Kopje" Scale which appeared to threaten the existence of the Msassa trees at Salisbury. The sudden abundance of this hitherto unknown insect seems difficult to account for, but it was undoubtedly due to a check to its natural parasites due to complicated causes which can, however, be vaguely understood in the light of what has been written above. The Mammoth Scale still exists in Salisbury, but in its ordinary limited numbers, and may not become a pest again for another ten or twenty years. For the three years ending 1910 a plague of hairy caterpillars defoliated the wild thorn trees at Bulawayo and in the surrounding country. During the last season the trees have hardly suffered at all, the caterpillars' enemies having obtained the upper hand. Many similar instances could be given. Many insects are normally kept under by their parasites, but at irregular intervals crop out as serious pests due to the temporary failure of their checks.

The importance of parasitic and predaceous insects to agriculture is thus very great, and the writer hopes that he has succeeded in conveying a little information about the different forms to the readers of this Journal.

EXPLANATION OF PLATES.

PLATE I.

- Fig. 1.—Microgaster ex Orange Butterfly (*Papilio demoleus*) greatly enlarged.
 2.—Cocoons of above on skin of dead caterpillar.
 3.—Braconid Parasite from Cabbage Aphis (*Aphis brassicae*).
 4.—Chalcid Parasite from Soft Scale (*Lecanium hesperidum*).
 5.—Large Ichneumon Fly.
 6.—Bembecid Wasp *re* Tsetse Fly.
 7.—Eumenid Wasp *re* Caterpillar.

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 2.— do. ex Wattle Caterpillar (*Haplopacha punctifascia*).
 3.—Tachinid Fly ex Black Caterpillar Pest (*Laphygma exempta*).
 4.—Sarcophagid Fly (*Cynomia pictifascies*) ex Swarm Locust.
 5.—Sarcophagid Fly ex Cricket.
 6.—Robber Fly (*Asilidae*).
 7.—Hover Fly (*Syrphidae*).
 8.—Ground Beetle (*Carabidae*).
 9.—Tiger Beetle (*Cicindelidae*).
 10.—Rove Beetle (*Staphylinidae*).
 11.—Twin Spot Ladybird (*Chilocorus distigma*).
 12.—Rodolia Ladybird (*Rodolia iceryæ*).
 13.—Pupa of Rodolia Ladybird on Leaf.

PLATE 3.

- Fig. 1.—Lacewing Fly Adult.
 2.—Lacewing Fly Larva.
 3.—Lacewing Fly Eggs.
 4.—Assassin Bug (*Reduviidae*).
 5.—Stink Bug (*Pentatomidae*) *re* Leaf-eating Beetle Grub.
 6.—Dragon Fly.

Second Report on Experiments.

BOTANICAL EXPERIMENT STATION SALISBURY,
1910-1911.

By J. H. HAMPTON.

This report on the results of experiments carried out on the Botanical Experiment Station, Salisbury, during the season 1910-11, is intended chiefly for the information of those farmers who have not had an opportunity of visiting the Experimental Plots and of seeing for themselves what crops can be profitably grown under ordinary conditions in Southern Rhodesia. It may be mentioned that samples of the seed of all the crops dealt with in this report are issued free to farmers under the terms of co-operative experiments, and thus an opportunity is afforded them of testing the most suitable crops for their own particular farm and district.

The soil at the experiment station is very uniform, and consists of the strong red loam common to the district lying north-east of the Salisbury township. In depth it varies from four to seven feet and gradually merges into a stiffer sub-soil.

The rainfall from the 1st October, 1910, until the 31st May, 1911, amounted to 30.29 ins. which is approximately the average yearly rainfall for this part of the district.

With the exception of the mangels, carrots, swedes, sugar beet, and kohl rabi, which were manured at the rate of 12 tons kraal manure and 50lbs. nitrate of soda per acre, all crops were grown without manure or irrigation. Part of the ground was broken up for the first time in July, 1910, whilst the remainder was first brought under cultivation the previous season.

LEGUMINOUS CROPS.

DRYLAND LUCERNE (*Medicago Sativum*).—The half-acre plot of dryland lucerne laid down in December, 1909, has only given moderately satisfactory results during the past season.

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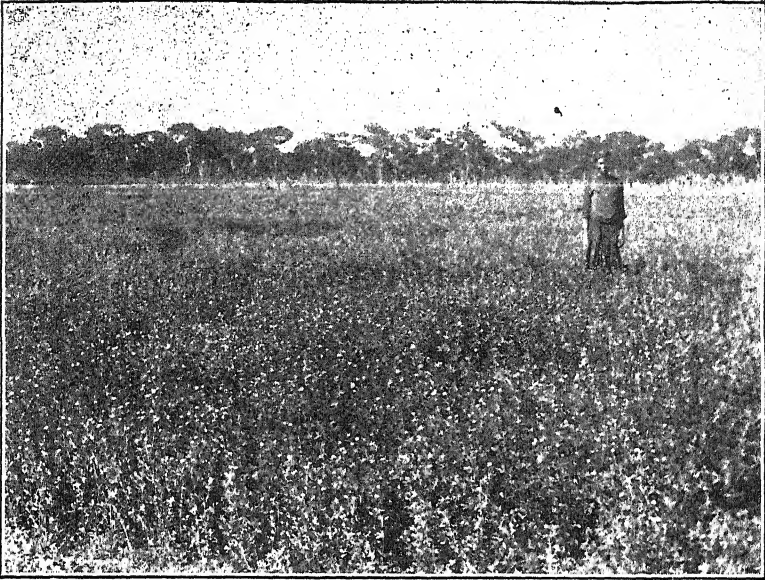
LEGUMINOUS CROPS.

DRYLAND LUCERNE (*Medicago Sativum*).—The half-acre plot of dryland lucerne laid down in December, 1909, has only given moderately satisfactory results during the past season.

The growth has not been very robust, and the stand has been badly affected with lucerne "leaf spot." The crop made good growth after the first rains in October, and was not long in reaching a height of about 15 ins. when the "leaf spot" began to make its appearance. The lucerne was then cut short and the ground harrowed in order to try and arrest the disease, but the subsequent growth was affected in the same way, and the crop had to be cut when it had attained a height of about 12 ins. and before flowering.

With the idea of improving the conditions under which the lucerne is grown, some soil from the Cape Colony lucerne fields in which the nitro-bacteria are present and form nodules on the roots of the plants was harrowed into part of the plot at the rate of 200 lbs. per acre. This treatment did not seem to affect the plot to any great extent, as the last cutting proved no better than either of the previous two, nor did the treated part show any superiority over the untreated part. Altogether, from the three cuttings, there resulted about half ton of dried hay. Possibly the beneficial effect will be more marked next season, but, although it may appear that in Rhodesia dryland lucerne may not give the same satisfactory results which have been experienced in the other South African Colonies, yet it will always prove a profitable crop for pasturing sheep, cattle and pigs during the summer and early part of winter. To those farmers also who intend rearing ostriches a well-established plot of lucerne will be of great value and will well repay the cost and labour entailed in its cultivation.

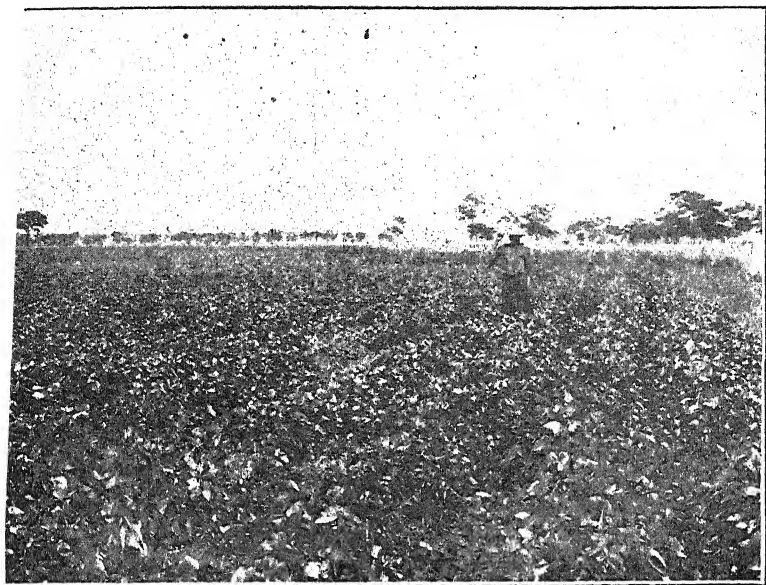
In addition to the plot above referred to, another half-acre plot, on which ground-nuts had been grown the previous year, was sown on the 16th December with three varieties of lucerne—Hunter's River lucerne, Province and Turkestan lucerne. The seed in each case was drilled in rows 15 inches apart and sown at the rate of 15 lbs. to the acre. Up to a certain point the growth of all three was uniform, but later the Province and Turkestan varieties seemed to fall off, whilst the Hunter's River maintained an even growth, with the result that a few bales of hay were obtained from this variety, whereas the former two were not worth cutting. At the present time the Hunter's River lucerne stands about 10 inches high and is being cut for lambing ewes, who prefer it to



Egyptian Clover. Botanical Experiment Station



Teff Grass. Botanical Experiment Station



Velvet Beans. Botanical Experiment Station



Victoria Wheat (summer grown). Botanical Experiment Station

either green oat forage or vetches. The deterioration in the Turkestan and Province varieties may be attributed very largely to the three weeks' drought which occurred during the early part of February, and also to some extent to the ravages of a variety of cut worm which infested the ground at this particular period.

It will be interesting to note how the Hunters' River lucerne succeeds during its second year, as its growth during the first year marks it out as the variety most suited to Rhodesian conditions.

EGYPTIAN CLOVER (*Trifolium Alexandrinum*).—Owing to the promising results obtained from this crop on new land during the season 1909-10, a further trial was made this year on land which carried vetches last season. The seed was sown broadcast on the 15th December, at the rate of 20 lbs. per acre. This seeding appears to be too light, as the crop came up very thinly. Germination, however, was good, and the growth rapid. On the 15th March the crop came into flower, and was cut for hay on the 25th of the same month. When dried and baled the weight of first class fodder from the quarter acre plot was 225 lbs., or a yield of 900 lbs. per acre. Two days after cutting the aftermath began to show, and at the present time (July 4th) the clover stands about 15 ins. high, and is being cut for seed in order to obtain some acclimatised seed for sowing next season. The hay resulting from this second crop should weigh about 250 lbs, so that for the season a yield of about 1 ton of cured hay, per acre has resulted. The Egyptian clover, however, has not done so well as last season, yet a heavier sowing would have no doubt produced a better yield, and the crop seems undoubtedly suited to the country. The fodder is also of higher feeding value and market worth than oat forage, and, in addition, the aftermath provides excellent late summer feeding for sheep and cattle.

VELVET BEANS (*Mucuna utilis*) were sown on December 27th, on half an acre of new land in drills 3 ft. by 2 ft., at the rate of 25 lbs. of seed per acre. A very even and good germination resulted, and by March 30th the plants had met in the rows and almost covered the ground. The crop was cut on May 20th, and the yield of cured hay was at the rate of

3,680 lbs., or $1\frac{3}{4}$ tons per acre. The yield would have been even more if the plants had been cut sooner, as a good many of the leaves by that time had withered and fallen off.

COWPEAS (*Vigna catjang*).—Five different varieties of cowpeas were tested on new ground, but only two of these—Black-eyed Susan and Iron Cowpea—gave satisfactory results. The other varieties—Mixed Clay, Wip-o'-Will, and Wonderful Cowpea—were attacked in the early stages of growth by a "green aphid" and never really recovered, their leaves retaining a mouldy appearance up to the time of reaping. All the varieties suffered from the attacks of the common black and red beetles (*Mylabris oculata*), which are always so destructive amongst leguminous crops. It is a matter of interest that whereas the velvet beans made a more vigorous growth than the cowpeas the former produced none of the nitro-bacteria nodules, which were found in large numbers on the roots of the latter. However, the velvet beans suffered from none of the pests which attacked the cowpeas.

Comparing the results obtained from the two crops—velvet beans and cowpeas—the preference must be given to the former, both as regards yield and feeding qualities. The mouldiness of the leaves of the cowpeas due to the attacks of the "aphid" renders the crop less appetising to animals than it otherwise would be. The value of velvet beans as a fodder was shown last year in the fact that the cattle at the Experimental Farm, Gwibo, refused to touch Boer manna hay, Teff grass hay or Veld grass hay, so long as the velvet bean hay was available.

LUPINES (*Lupinus spp.*)—Three varieties of lupines—the White, the Blue and the Yellow—were again sown on new land, and the results are identical with last year's trials. The yellow variety has again proved the earliest, being ready for cutting as soon as the other two were in flower. The growth of the white and blue varieties has, however, been much more robust, many of the plants attaining a height of from four to five feet. The fact that lupines cannot be utilised to any extent for feeding purposes tells against them when comparing them with other leguminous crops such as velvet beans and cowpeas, yet they may prove valuable as a green manure, and may be found useful as a rotation crop with tobacco on sandy soils.

GROUND-NUTS (*Arachis hypogaea*).—A comparative trial was made this season of four varieties of ground-nuts—Virginia Bunch, Virginia Runner, North Carolina Ground-nut, and a local variety grown by the natives. The shelled nuts were sown in rows 2ft. x 18ins. on the 20th December. The germination was rather uneven at first, but after a light cultivation a more vigorous growth resulted. As regards growth of top, there was very little to choose between the four, but the three American varieties proved far superior to the local variety of nuts in respect to both yield and quality. On estimating the average yields it was found that the Virginia Bunch produced 480lbs.; the Virginia Runner, 600lbs.; the North Carolina, 550lbs.; and the local variety only 420lbs. per acre. These returns are lower than they otherwise would be owing to the depredations of crows, but they give a rough idea as to which is the most prolific cropper. The nuts of the imported varieties are much larger and of better appearance for human consumption than any local variety grown by the natives.

It must be taken into account when examining these results that the soil at the Experiment Station is unsuited to this crop as ground-nuts flourish best on light sandy soils.

To a country possessing such large tracks of soil suitable for the growth of this crop it appears likely to prove a source of considerable profit as an oil producer should local factories arise, as a necessary and cheap form of food for natives employed both on mines and farms, and also as a nutritious food for both cattle and pigs. As a rotation crop also it is one which deserves far more attention than is at present bestowed upon it.

SWEET POTATOES (*Ipomoea batatas*).—Of the two varieties of sweet potato—American and a kind obtained from Natal (Nansemond)—which have been tested during the past season, there is very little doubt as to which is the more valuable for the Rhodesian farmer. The vines of the Natal variety keep close to the ground and possess but few leaves, whilst the American variety produces an upright dense foliage. The difference in growth is of the utmost importance as the vines produce a useful green fodder or when mixed with maize stocks may be converted into silage.

Nor is it in regard to the vines alone that the American surpasses the Natal sweet potato. The tubers of the former were large and well-shaped, resembling in general appearance the ordinary potato, whilst the tubers of the latter are extremely poor.

The weight of tubers from the one-twelfth acre plot of the American variety was 2,002 lbs., which gives a yield of about 12 tons to the acre.

The advantages and uses of this crop are so many that it behoves every Rhodesian farmer to possess his patch of sweet potatoes. The crop is easily grown, will thrive on almost all soils, and is easily propagated by either tubers or slips. When properly cooked the tubers are by no means to be despised as a culinary asset; both vines and tubers form an excellent food for cattle and pigs, and the mines offer a ready market for any surplus supplies.

SUMMER FORAGE CROPS.

WHEAT.—The success which attended the growing of Victoria Wheat and Bob's Rust-proof Wheat on the Experiment Station and Gwibi Experiment Farm during the previous season warranted this year a further trial of these two varieties. On the 30th Decembr the seed of both was sown broadcast and harrowed in at the rate of 64lbs. per acre in two $\frac{1}{4}$ -acre plots, which produced the same crops last year. The germination was excellent, and the stand good but slightly too thick. Up to the middle of March the growth was healthy and vigorous, but afterwards rust appeared, and by April 10th the Bob's wheat had entirely failed, whilst the Victoria recovered except in small patches, and was fit for cutting on May 11th. When threshed the yield of good grain from the Victoria variety amounted to 1,040lbs., or about five sacks per acre. The straw averaged about 4ft. in height. The fact that these two varieties were grown side by side makes the success of Victoria wheat the more remarkable.

Another wheat, Early Gluyas, which has already done well in the Melsetter district, was also given a trial on a $\frac{1}{4}$ -acre plot which carried maize last year. The same amount of seed was used as with the other two wheats, but the sowing was not made until January 11th. Owing to rain the seed could not be harrowed in, so germination was not so strong

nor so even as with the Bobs and Victoria varieties. However, the crop kept remarkably free from rust, and by March 30th had reached a height of about 4ft., with the grain setting well. This wheat was reaped four months after sowing, and threshed a month afterwards. Rather less than 200lbs. of seed was produced from the $\frac{1}{4}$ -acre, so that the yield may be taken as about four sacks to the acre. If Gluyas wheat had met with more favourable conditions during the early stages of growth, the yield would have been much larger, perhaps even exceeding that of the Victoria wheat.

It is gratifying to obtain such promising results from wheat grown during the summer months, as it is of the utmost importance to find other readily marketable crops besides maize. Reports have been received from several farmers who have tried both Victoria and Gluyas wheat from seed supplied for co-operative experiments, and so far the results for the year have been satisfactory. It appears, therefore, that in Victoria wheat, which has given satisfactory results two seasons running, a summer wheat has been found which can with safety be tested on a larger scale than hitherto.

OATS.—Since Sidonian oats have done well as a summer crop in other parts of South Africa, a trial was given to this variety on a quarter-acre plot on which maize was grown the previous season. On the 3rd January the seed was sown broadcast and harrowed in at the rate of 72lbs. per acre. A good germination resulted, but the stand was rather too thick. The crop, however, made good growth, and although it became rather badly rusted during the heavy rains which occurred about the middle of March, it headed out very well, and was fit to cut for forage on the 2nd May. The crop was then well in ear and the grain good, but owing to unevenness in ripening, it was thought more advantageous to have it cut for oat-hay than harvested for seed. The weight of cured hay from the plot amounted to 590lbs., which gives a yield of a little more than one ton per acre.

On the 25th January a further half-acre of Sidonian oats was sown on new ground and harrowed in at the rate of 60lbs per acre. In order to improve the quality of the fodder a light sowing of ratches was made on the same ground. This plot has done much better than the other, as rust has never put in an appearance. The crop is being reaped to-day (5th

July) for oat-hay, but a small patch will be allowed to ripen fully, so that a small quantity of acclimatised seed will be available for sowing next season. The absence of rust from this plot sown at the end of January seems to point to the advisability of later sowing than has been previously practised.

Two other varieties of oats were tried—White Tartar and Black Winter oats. Both were sown at the end of January and suffered from the drought which occurred during the early part of February. The Black Winter oats are very slow growing, but the White Tartar variety has since made such good progress that the crop, although a little uneven in growth, is now in ear and promises to ripen well. Some of this seed will also be kept for next season's sowing, as the result this year is considered satisfactory enough to warrant a further trial.

The results of summer oat experiments seem to justify the hope that Sidonian Oats at least may be grown successfully in some parts of Southern Rhodesia. Further experiments may produce other rust resisting varieties, but at present Sidonian oats seem to be the best suited to produce a good supply of green oat forage during the late summer, and of dried oathay during the winter. Algerian oats are also doing well on some farms but are much slower to mature.

TEFF GRASS (*Eragrostis Abyssinica*).—On January 8th one acre plot of new land was sown to Teff grass at the rate of 7 lbs. of roughly cleaned seed per acre. The usual method adopted of sowing this seed is to mix it with about four or five times its bulk of sand and sow broadcast, but this method was not thought necessary with the uncleaned seed. The germination was poor owing to the drought and rawness of the ground, and in places patches of 3 to 4 square yards were blank. The crop was cut on March 28th, when it had reached a height of from fifteen to eighteen inches. Owing to the bad germination only 1,908 lbs. of dry hay were reaped, but the yield per acre would have been well over a ton if there had been a full stand. Five weeks after cutting the aftermath came into seed again at a height of about eight inches. The sheep have been feeding on this second growth since the beginning of May (now July 7th) and much prefer

it to the veld grass in the vicinity; in fact when taken off teff grass and put outside the wire fence they lie down and refuse to eat until brought back again.

Besides producing excellent hay and pasture, Teff grass has further uses as a cleaning and green manure crop, so that it can be recommended to all Rhodesian farmers who wish to remedy the present practice of abandoning fallow lands for several years to weeds and worthless grasses.

MILLETS.

Boer Hanna (*Setaria italica*), *Japanese Millet* (*Panicum crasgalli*), *Hungarian Millet* (*Setaria germanica*), *Californian Green Moha* (*Setaria italica* sp.).

A comparative trial of these four millets was made on new land. The Boer Manna and Californian Green Moha occupied half-acre plots, whilst quarter-acre plots were sown to the remaining two. The seed of all was sown broadcast on the 29th December at the rate of 17lbs. per acre. A fairly good germination followed as the weather conditions proved favourable, but the seeding was too thick. On the 20th March, or rather less than three months from time of sowing, the Japanese millet, Hungarian millet and Californian green moha were ready for reaping; the Boer manna, however, was not cut until the middle of April. The yield per acre of cured hay from the Boer manna was 3,190lbs., or $1\frac{1}{2}$ tons; from the Hungarian millet, 1,040lbs. or $\frac{1}{4}$ ton; from the Japanese millet, 1,236lbs. or 3-5ths ton; and from the Californian green moha, 2,100lbs. or 1 ton.

As far as yield goes, the results are all in favour of Boer manna, so that farmers should pay greater attention to this crop particularly, as its beneficial effect in rotation with maize has been recognised for a long time. There is also a good market in Rhodesia for Boer manna seed.

Japanese millet is not suited to red soil, but grows well on wet ill-drained land, and in soil of this nature would produce a valuable rotation crop to maize. It has the advantage over Boer manna in that it does not suffer from rust, which has a slightly injurious effect on the fodder of the latter.

BUCKWHEAT.—This crop was given a trial on a quarter-acre plot of new land, the seed being sown broadcast at the

rate of 48lbs. per acre. The seed was not quite pure, and the crop ripened unevenly. A little less than three months after sowing all the crop was reaped, except for a few stalks of unripened ears, which were left to mature. The amount of seed from the quarter-acre plot was 375lbs., which equals a yield of $7\frac{1}{2}$ bags per acre.

This crop has been successfully grown in other parts of Rhodesia, and more attention might be bestowed upon it, since the grain is valuable for feeding to fowls and pigs, and the straw proves a useful fodder for cattle.

TEOSINTE.—A trial was given last season to Teosinte on new ground, but owing to bad germination the crop was not so successful as expected. During the past season a further trial was made on the same ground as last year. After soaking for 48 hours, in order to assist germination, the seed was sown on the 5th December in rows 4ft. apart, a few grains of the seed being dropped at intervals of $2\frac{1}{2}$ ft. The germination was only moderate, but the growth after the crop had established itself was rapid and robust. There were a few blanks, but the crop made such good growth that by the middle of March it had reached an average height of about five feet, and had covered the ground so well that the blanks were hardly noticeable. The crop was cut on the 2nd June, and made excellent silage when mixed with mealie stalks and cowpeas. The weight of green fodder from the $\frac{1}{4}$ -acre plot was 5,000lbs. making a yield of 10 tons per acre. Stalk borer, which is very prevalent on the Experiment Station, caused a good deal of damage during the latter stages of growth.

SUGAR CANE (*Saccharum officinarum*).—A good alternative crop to Teosinte, and one which is more easily propagated, is to be found in Sugar Cane, a small plot of which was planted from slips in January, 1911. The fodder of the sugar cane keeps green much longer and resists the attacks of frost better, while the crop has the further advantage of being perennial.

To those farmers who aim at winter dairying a few acres of sugar cane will prove of immense value. During the season several cuttings can be obtained, and if desired the last regrowth can be depastured. Sugar cane is also an excellent feed for pigs, and as a crop it can be strongly recommended.

(To be continued.)

Economic Entomology.

INAUGURAL LECTURE.

(2nd March, 1911.)

APPLIED ENTOMOLOGY.

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This lecture is the first of a series dealing with general entomology, with special reference to the application of the science to agriculture, commerce medicine, and sanitation. There is at present no one general course of lectures or training in entomology as a special subject given in England, and it is fitting that such a course should be initiated at the Imperial College of Science and Technology, whose function it is to provide the highest instruction in branches of science which have practical application.

Entomology used to be concerned with the study of insects solely from the biological and systematic sides; that is, entomologists, were more concerned with the studying the habits of insects and with classifying them than they were with checking and controlling them or with exploiting them as part of the world's commerce. Even now the value of the economic entomologist and the part he plays in daily life is very little appreciated in this country; there is in England no Government Entomologist, no entomological experiment station, and no organisation which does for the country as a whole what economic entomologists do in India, in our Colonies, and in the United States. In order to make clear to you what function an entomologist serves, I must refer mainly to the work they do in our Colonies and in India, and as I have for eleven years worked in the West Indies and India as Government Entomologist, I can more easily select my illustrations from the work which I have seen myself in those countries.

Applied entomology, which is a development of pure entomology, deals with insects which affect man; the greater number of insects affect man directly in no way at all; they have an indirect bearing on man, as they have their part to play in the economy of the earth; they scavenge and cleanse the earth; they pollinate flowers and make possible the fruiting of many plants; they populate all parts of the earth's surface, except the sea, and in numbers of kinds as in actual abundance they exceed all other forms of animal life visible to the naked eye. In these respects they are of interest but not of direct importance, and while the study of insects is a fascinating branch of natural history, there would not be any necessity to have economic entomologists if they did no more.

The study of the large animals, of birds, of fishes, and of snakes, is intrinsically more interesting to the average zoologist and nature student; their importance and influence on man are more obvious; and it is perhaps due largely to this that entomology has come to be a specialised branch of science, till now confined more to the differentiation and classification of the immense number of forms than to other branches of study; it is thus less developed from the economic and technical aspect than are other branches of zoology or the sister sciences of botany, chemistry, and electricity. It is only lately that the significance of the insect world has become apparent; and it is only owing to the immense importance of tropical entomology that the study of insects from the economic aspect has received its greatest impetus. The opening up to agriculture of new tropical countries, the increasing competition in the cultivation of tropical products, the discovery of the part played by insects in disseminating human disease, have brought entomology to the front, and have shown that, far from being a science concerned solely with the minute classification of interminable varieties and species, it is a science which has a great significance for man, and one which requires to be developed in serious earnest if we are to be in a position to harvest our crops, to cope with disease, and to populate tropical areas successfully. In closely cultivated countries with temperate climates, insects have not the significance that they have in tropical countries and in newly-planted areas, and it is

perhaps due to this that in the study of economic entomology England is somewhat behind America and some other nations.

Out of all the hundreds of thousands of kinds of insects which now live on the earth, a small proportion are of very vital importance to man, affecting his agriculture, his cattle, his merchandise, and causing or transmitting disease to a man on a very large scale. It is these with which we are now concerned, and it is on their account that the economic entomologist comes to play so vital a part at the present day.

All plants, whether crop plants or wild plants, are affected by insects, which live on them, destroy them, lessen the value of their produce, and increase at their expense. In nature, this is limited and checked; but in cultivated crops, grown in blocks, under artificial conditions, these insects become abundant, increase beyond nature's due proportion, and take a very perceptible part of the crop.

It is not only as agents of destruction that insects have a great economic significance; large industries depend upon insect activities, and the useful insects are no small item in economy. Bees offer the most familiar example; the production of beeswax and honey is dependent upon a very few species of domesticated bee, which man has exploited and whose products have been obtainable in no other way. This is now a profitable industry to many thousands of beekeepers in practically every country, and the production of honey and wax is now carried on on a very large scale.

Silk is another very large insect industry, which has existed for centuries, but which has, in the last century, benefited enormously from the application of scientific study. Silk is produced mainly by one species, formerly wild, now domesticated, and also by a few wild species and some minor domesticated ones; the study of these insects by entomologists has had, and is having, remarkable results in the industry, and the production of silk is one of the big industries of the world which might be very much extended in the British Empire; the total production of the chief grade of silk, raw silk, is about forty million pounds annually, worth about twenty million pounds sterling, and there is also the waste silk, tussore, shantung, eri, and other kinds, totalling probably as much again.

Another industry which is less familiar is the shellac industry; lac is the resinous covering produced by a few species of scale insects living on trees in India, Burmah, and Malaya; the value of the production in India and Burmah exceeds three million pounds sterling annually, and no substitute for this insect product is as yet known. Scientific entomology is only now beginning to be applied to this insect, but there is a large field for research and improvement, and some progress has been made. Other minor insect industries there are also; the cochineal insect in dyeing, the blister beetles in medicine, the various insects used as food are examples, and there is a considerable trade in insects used as foods for birds.

Nor is it certain that there are not great possibilities in the future; while science has to a large extent exploited the plant world for commercial products, little has been done systematically with insects, and while there are important insect industries in India, other tropical areas may have unexploited possibilities which the future will bring forward. The subject is so new, so little investigated, that it is impossible to say what product the systematic investigation of tropical fauna may bring out. There is here a large field for research and inquiry, and one in which England, with the vast tropical areas she is colonising and opening up, is particularly interested.

It is, however, from the destructive side that insects are of the greatest significance to man, and though the results of practical entomology are in a sense indirect they are of very great commercial importance. Cotton is a crop in which commerce is at present very deeply concerned and whose production in the Empire is being extended; in this crop destructive insects play a very great part; it is probable that were there no boll worms, no cotton 'stainers, no cotton caterpillars, the gross yield of cotton from the area now existing would, without further effort on man's part, be increased ten to twenty per cent.; in Sind and the Punjab in one year the cotton crop failed wholly from the attack of the boll worm; the loss in cotton not produced was in excess of £2,000,000 sterling, and this was due solely to the work of one cotton pest. The same applies very markedly to cotton which is introduced into new localities or to new varieties introduced

in new areas ; the first trials of Egyptian cotton in many parts of India failed wholly from the unforeseen attacks of the pink boll worm ; in the trials made of tree cottons in many countries it has been found that the pests are the factor determining success or failure. If the pests are neglected it is commercially impossible to grow tree cottons in India at the present time, and for want of realising this much money has been wasted ; in every cotton-growing country insect pests are of the first importance, and no one growing cotton in any part of the world can afford to neglect them.

The same may be said of very many crops ; every crop has its pests, and we have to deal with them efficiently if we are to cultivate crops as commercially successful undertakings. The pests may be virulent special ones, such as the woolly aphis of the apple, the phylloxera of the vine, the destructive moth of the potato ; these limit themselves to special crops and, if not treated, the industries concerned are ruined. Or the pests may be general ones, such as locusts and swarming caterpillars, which attack almost all crops and which devastate large areas, appearing every few years in great abundance and doing great damage. In all countries crop pests are known, more so in the tropics and in countries where very large areas are given up to growing a few crops, as in the wheat areas of Canada, the cotton areas of the United States, Egypt, and India, the rice areas of India. In England the conditions of agriculture and climate, the dense cultivation, the high standard of cultivation, and the availability of scientific resources make such large attacks impossible, and we cannot quote striking cases, *though the aggregate damage done to crops is still large* ; but in other countries, notably in the tropics, these attacks reduce the crops over very large areas, making systematic campaigns, carried on with all the available resources of Government, a necessity. In the Bombay locust outbreak of 1903-4 we spent £14,000 in fighting the pest ; in Massachusetts on the gipsy moth campaigns as much as £20,000 to £40,000 were spent annually in checking the pest ; and similar sums are spent—and are well spent—in similar campaigns in other countries. These sums are only a proportion of the loss these countries would otherwise sustain were these pests not checked, and we are not able to estimate the gross losses sustained by agriculturists throughout the world. A recent report puts the

loss sustained in the United States from the pear thrips, a minor pest, at one million dollars annually, and in the United States, where the organisation of entomology renders figures available, the total loss from destructive insects is put at three hundred million dollars annually. In British India the losses to the eight principal crops at a conservative figure amount to fifteen million pounds per annum, and to the country as a whole, in all crops, amount to well over double that amount.

Were these losses unpreventable, these figures would be of no value, but very largely the losses are preventable, either by the individual action of the farmers themselves or by the collective action on the part of the people, aided by Government. Whatever this action is, it must be founded on and guided by scientific entomology, *i.e.*, on an accurate knowledge of the lives and ways of the insects causing the losses. Year by year the successes of entomology grow greater; a notable case is the success of the collective action of the South African Colonies against their locusts; the migratory locusts of North India and the Bombay locust are now fought successfully; the potato moth, which in India and Australia did so much damage, has been checked by simple means within the reach of the cultivator; the phylloxera of the vine and the woolly aphis of the apple have been met by the introduction of resistant stocks on which the pests will not live; and if there are many cases where remedies or preventives are as yet beyond the reach of the farmer or where no profitable remedy has been discovered, there are far more cases where remedies or preventives are applied with profit and success.

I will quote a case where we have definite figures: In 1905 the cotton crop failed over 700,000 acres in the Punjab; eight districts reported no yield at all, four reported a quarter crop, and one a crop a trifle over a half; in 1906 we adopted three remedies, impressing them on the cultivators with all the resources of Government but not actually spending any large sums of money; one remedy was a failure, two were successful. In 1906 the districts that had no yield in 1905 reported an average of 53 per cent., those with a quarter yield reported 62 per cent., and a loss of two and a half million pounds sterling was reduced to one of only seven

hundred thousand pounds sterling in the next year, and the crop has since been normal. These remedies were not introduced into Sind, and in 1906 the cotton crop there was again a failure till, in 1907, we applied remedies and produced a normal state of things. We have campaigns of this sort going on year by year in India and our Colonies, and it is this class of work that our entomologists are constantly engaged in. There are many problems to be solved, but the experience of the past has shown that the application of entomological science to similar problems has been very largely successful.

Nor is this sort of large combined campaign the only method that has proved successful; probably greater aggregate good is done by teaching farmers about their pests and by means of lectures, leaflets, and coloured illustrations, giving them reliable information, teaching them how their pests live, and giving them the best technical information about remedies and insecticides.

This is the main work of the economic entomologist, and the success of it depends upon its accuracy, its practical utility, and its being available to every farmer or planter who requires it. To do this work requires a thorough knowledge first pure of entomology; it is based upon a groundwork of thorough knowledge as a whole, and before any beginning can be made, very thorough training is required. It is this training which we hope to give, rendering available for England and the Empire men thoroughly skilled in entomology, able to apply themselves to practical problems without having to acquire a knowledge of entomology to begin with.

In other ways also, the influence of destructive insects is fully shown; our cattle and domestic animals suffer from insects in a very marked way: the warble in cattle is stated to affect over 48 per cent. of the hides exported from India, and the loss in the value of American cattle passing through Chicago in six months was put at over three million dollars; sheep suffer from maggots in the brain, horses from bots in the stomach, and most of our valuable domestic animals have parasites of one kind or another.

In forestry the influence of destructive insects is very marked; in nature, where the forest is undisturbed, matters adjust themselves to a large extent, but the earth is being cleared of natural forest and man is making forestry a business in which artificial conditions are established, the natural law is upset, the balance of life is altered, and outbreaks of insect pests become a very serious matter. The loss annually in American forests is put at twenty million pounds, and the losses in tropical forests are probably much higher; in planting and working large areas, in the preparation of working plans for felling and re-planting successive areas, the influence of insects and the methods of meeting them cannot be neglected, or the losses from this cause become enormous.

Nor is this loss confined to the growing plant or animal; from the time it is harvested to the time it is consumed, grain, timber and foodstuffs must be guarded and protected; the ravages of weevil in wheat and rice amount to a very serious total, especially in hot countries. In India, the loss in wheat amounts to over a million pounds sterling annually, and the loss in rice to probably three times that on the average. Flour, meat, dried fish, dried fruits, almost every form of food must be preserved very carefully if insects are not to infest it. We have had to deal with flour moth in flour mills, with beetles in brush factories, and with boring beetles attacking bamboos, wood, and the like. In the tropics the white ant is a very destructive agent; a commission is working now on the railway sleeper problem in India, the white ants finding railway sleepers excellent food in some parts of the country, and this problem involves a very large amount of money. Every working entomologist has abundant experience of these and similar problems, and it is an important part of his work to cope with these pests.

Here in London, in a temperate climate, you will think I am drawing an exaggerated picture, but I am not doing so, and if I take my illustrations from the tropics very largely, it is because it is there the cases are the more striking and numerous, and because I have worked there so long. *The problem is the same here*, and the pioneer work in England of Curtis and Miss Ormerod in the last century showed what losses there were and started the development of the subject,

In all these cases, whether on crops, domestic animals, or stored products, there is but one way of meeting the problem, and that is, first study and then the application of common-sense remedies based upon that study. We can do nothing until we know our insects, know how they live, where they lay their eggs, how long the eggs take to hatch, where the grub lives, how it feeds, how long it lives, and every detail of its life from start to finish. That is a matter of scientific enquiry, and it is only on this knowledge that we can base our remedies or preventive measures and hope to either fight the pest or show farmers how to do it for themselves. We have to study the insect as a living being, to keep it in captivity and breed it, to watch it in the field, to find out its enemies, its peculiarities, and really know its life and habits at all seasons of the year before any progress is possible. There is no magic that we can use, no one perfect simple remedy that fits all cases, no universal insecticide; for each case careful study, then experiment in the field, and then, with the co-operation of the farmer, the testing and application of remedies on a large scale. It is with this that scientific entomology is concerned, and it is only in this way that progress is possible. In India the cultivator will tell you that the caterpillar that bores in his canes comes from the well water he irrigates with; a little investigation shows that the caterpillar comes from eggs laid in clusters on the leaves of the cane, and that, with some borers at least, these eggs can be cheaply and simply removed. This is a very simple instance of what I mean by the study of the pests' habits, and every successful remedy or preventive is a similar instance. The economic entomologist does this only, and his object is to find a weak spot in the life history of the insect, where, by some simple measure or by some modification of the local agricultural practices, he can destroy the insect or make its occurrence impossible.

In all cases I have mentioned up to now, insects affect man indirectly, but the last twenty years have shown that insects have a great significance also as carriers of disease to man and to domestic animals, and we are here confronted with a very large and difficult problem. It is common knowledge now that malaria is communicated to man by the bite of one of several kinds of mosquitoes; to those who have lived in

the tropics the significance of this will be obvious. Few Europeans in the tropics escape malaria; many die from it, and the mortality from malaria among Europeans and natives in a bad season may be awful. Since this discovery was made it has been found that other diseases are carried by mosquitoes and other biting insects; yellow fever is carried by a mosquito common in the tropics, so is filariasis by other common mosquitoes; the rat flea is the agent which spreads plague; the tiny midge of the genus *Phlebotomus* carries Pappataci and similar fevers; the large flies of the genus *Glossina* carry sleeping sickness of man and similar typanosome diseases of cattle, horses, and dogs. The common bed-bug is suspected, but not definitely convicted, of carrying kala azar and similar diseases. It is no exaggeration to say that these discoveries open a new field, and, when one considers the dreadful mortality these diseases cause, a very wide one. The significant point in attacking these diseases was thought to be the germ or organism carrying them; but the insect is now shown to be at least as important and, in many cases, a far more attackable point. Plague in India has been a terrible scourge and might be so in Europe; but the plague flea and the plague rat are far more easily controlled than is the plague germ, and it is on them that the spread of the infection depends.

Let us see what occurs in plague. A plague rat, that is a rat infected with the plague germ, is, we will say, let loose in London or anywhere you please; its fleas suck its blood and draw in the plague germ; the rat gets worse and dies. As its body gets cold, the fleas leave it to seek another rat or some other warm animal on which they can live; they bite that animal and give it plague also, thereby infecting other fleas, which leave that rat when it dies. Now, were these fleas only to bite rats, the disease would stop there, but they do not. They bite man also, incidentally, and he gets plague, and probably dies of it. That is why, in India, when rats begin to die, the people at once have to avoid being bitten by a flea from a dead plague rat, and if they are wise they leave their houses. Now, clearly, here one link is the flea, and we want to know all about it; where does the flea come from, where does it lay its eggs, how does the grub live, and so on. Instead of using disinfectants to kill the germ, which was

supposed to live in the dirt of the house, we now use insecticides to kill the fleas and to prevent them breeding. One reason why Europeans in India seldom get plague is because they live in clean houses, where fleas cannot breed or live. If there is going to be an epidemic of plague in England, it is to the plague rat and the plague flea we must turn our attention.

The problem is, then, to a large extent an entomological one, and so, in all insect-borne diseases, it is the insect we have to study and to fight. Here again it is in the tropics more than in England that the work lies, and it is perhaps difficult for anyone who has not lived and suffered in the tropics to realise the immense importance of entomology in this respect. However one lives, mosquitoes and sandflies bite one, the flea comes off the dead rat and jumps on to one, the bed-bug lurks in railway carriages and public places, and there is no escaping the ubiquitous disease-carrying insect; if it is bad for Europeans, it is worse for natives; since plague recommenced in India, in 1896, seven millions of people have died, people living in small houses, with little idea of sanitation, with small means, and no power of understanding what plague was or how it came. What precautions can they take against fleas, or how can they leave their homes and their work if rats begin to die round them? It is the same with malaria; in a bad season, as in the Punjab in 1908, and Behar in 1909, the mortality in the villages from malaria was truly awful. The mosquitoes can get to them and bite them; the one man who starts the infection may be the means of infecting scores of others, and so long as the mosquitoes last the epidemic continues unchecked. I wish I could paint a real picture of what these insect-borne diseases mean in the tropics and of the wastage of life they entail; when it is realised, one realises also the part the entomologist must come to play in the future, and the absolute necessity, if the tropics are to be opened up and cultivated, of this special kind of preventive entomology being adequately developed. If we are ever to colonise the tropics, if we are to people them with healthy races, to develop them agriculturally, and to render available the immense amount of raw material they are capable of producing for England's manufactures and trade, it will be only when we have organised the entomology and successfully

tackled the insect transmitters of disease. A great deal has been done, especially on the medical side; the advances in tropical medicines of the last twenty years mark an epoch, but we are behind in our entomological organisation, and we want to take the matter more in earnest.

In England, if mosquitoes and sandflies do not bite, there are dangers of an equally serious nature from the house flies and flesh flies, which carry the typhoid germ. Flies which settle on food may carry and do carry germs on their feet and on their proboscis; the common fly should be vigorously exterminated and kept down, and in this respect there is very much to be done in this country.

Nor is it only the very vital demands of the present we have to look to. What does the future hold for us in this respect? Sleeping sickness has come into great prominence in the last few years, mainly because the areas in which the *Glossina* flies occur have been opened up and the disease has now affected persons not immune to it who were formerly not in reach of the infection; the opening up has increased the range of the disease. What is going to happen in the future as the tropics are opened up and rapid communication established to fresh tropical areas? Are we going to get more and more diseases communicated by insects, now confined to tropical jungles, but brought within our range by increasing means of communication? Is the yellow fever going to reach Indo-China and India, for instance, by means of infected mosquitoes carried by ships from the Panama Canal when that is opened? The yellow fever mosquito is already in India, but not the germ, and while a yellow fever patient cannot carry it a mosquito might. Is the sleeping sickness transmitter going to spread? Is plague going to establish itself in Europe and carry off thousands and millions in England? These speculations are quite justified on the analogy of sleeping sickness alone, and it is essential to make sure that our entomology is up to the standard of our medicine, and when the time comes that we shall be ready to tackle the insect that transmits the disease.

I may seem to have overdrawn the picture of the importance of the insect world, but, truly, anyone who has lived in the tropics will know that I have not exaggerated. From the medical and sanitary point of view the entomologist is going

to be very important, and in the last few decades the agricultural entomologist has already found his place. In the old days, the profits on tropical agriculture were very large and the losses were inappreciable; but that is so no longer. Larger areas are under sugar, tea, coffee, cocoa, and other products; the yields of wheat on virgin soils are no longer obtained, and the farmer all the world over has found he must look to the small percentage he loses to insect pests as representing a great part of his profits. He can neglect it no longer, and when he wants help it is to be the official entomologist he must turn.

If we are to be ready it will be only if entomology in the British Empire is organised and developed in a better way than it is at present. In all branches of applied entomology our chief need is trained workers, and it is a curious fact that though there are in the Empire more than thirty working economic entomologists, there is not in England any institution which trains economic entomologists or which gives a complete course of instruction in entomology. Our Colonies recruit their entomologists from America or take untrained men who get their training from experience, which is an expensive way. We should be able to recruit our men from England, as we do with all other branches of science, and it should be here in England that the training in entomology which must be acquired before any practical work is possible should be available. It is the object of the course which this lecture inaugurates to make a beginning with this training, and to try to do for England and the Empire what similar institutions have already been doing for years in America and other countries. It is the function of the Imperial College of science and Technology to supply the highest technical instruction in science, and it is fitting that such an institution should provide training in a subject of such importance.

England has recently sent three students to America to be trained in economic entomology through the generosity of Mr. Andrew Carnegie; but surely, seeing that our Empire has economic entomologists, and that our entomologists cope with as large problems as do the American Department, we should be able to provide the scientific training here in England and give our workers the special instruction

required for coping with these problems in the tropical areas of the Empire. Work as good as any in America is being done in our Colonies and tropical possessions; we want a great deal before this work will be properly organised and carried on; we want larger means, more men, less over-working; we want to differentiate research from executive work, and not expect the same man to do research, teaching, executive work, and the administration of pest Acts; we want to develop a class of what we may call executive entomologists for organising and carrying on campaigns; we want co-operation between different parts of the Empire, between England and the Colonies; but our greatest need at present is a training institution, a source of supply of young men properly trained in entomology and specially selected for the peculiar qualifications required in the economic entomologist. We must continue to depend upon America or to trust to luck unless we have this, and it is our hope that we can provide such a course and that the scientific training can be given here. England is not behind in other branches of entomology, and in the Colonies the work of practical applied entomology is as highly developed, considering the available resources, as it is in America; but we want to develop it in England, to organise the work, to provide a thorough course of training, and so be able to provide for England and the Colonies the trained men that are wanted now and that will still be wanted in the near future.

Full particulars concerning the courses of Lectures can be can be obtained on application to the Department of Agriculture, Southern Rhodesia.

Agricultural Union Congress, Umtali, 1911.

PRESIDENTIAL ADDRESS,

BY R. A. FLETCHER.

It had been usual, he said, in this Congress to ask the Administrator to open it, but as they all knew His Honour was not in the country, and the Acting Administrator, Mr. Newton, had not been able to come down to Umtali. As President of the Rhodesian Agricultural Union he welcomed them all to the eighth Annual Congress of the Union, and he would also like to express the pleasure he felt at seeing in the room the members of the Agricultural Department and also Mr. Jarvis, the Acting Chief Veterinary Surgeon. On behalf of the Union he would like to express the pleasure and gratification of the agricultural community with the work performed by these officials and the high appreciation held of the efforts they made on behalf of the farming industry. He greatly regretted the Director of Agriculture was not present, and he especially regretted that ill-health should be the cause of his absence, and trusted he would soon be able to resume his duties. When they took up their agricultural journals, saw the experiments conducted by the Department and read the reports of the Director of Agriculture, they had to admit that the head of the Department was a strenuous and conscientious worker, who had his whole heart and soul in his work. He was very glad to have the opportunity of paying this tribute to Dr. Nobbs, because in the past they had criticised very freely, and if they looked back they would all admit that their criticisms were at times not thoughtful. Farmers, he thought, were rather apt to speak from their hearts and at the spur of the moment. He would like to draw their attention to this and impress upon them the necessity of being careful in their criticisms, aiming always at securing the remedy sought and avoiding friction that could only be harmful. He

would also like to express regret at the absence of Mr. J. A. Edmonds, their old president, who was not now in the country. Mr. Edmonds had done more than any man in Rhodesia to bring about the co-operation of the different associations and form the Rhodesian Agricultural Union, and he hoped his absence was only temporary and that he would return to Rhodesia before long. It had been customary for the President of the Union to put before them a written address, but he was not going to do that; but simply touch on one or two points of interest dealing with the past year. Before doing so he would touch upon the finances of the organisation, which was a very important question. When the present officers of the Union were appointed last year, several matters which were brought to light very much surprised them.

FINANCIAL POSITION.

As they were aware, the end of the financial year was at 30th June. Their Annual Congress took place before that date, and therefore from year to year accounts were never fully written up and placed before the Congress. In fact the books of the Union were not closed until after the Congress had met. This naturally led to a good deal of confusion in the treatment of their financial affairs. When your executive met for the first time after they were elected, they were surprised at being asked to pass the balance sheet and accounts of the previous year. It proved a very difficult matter, and before the new committee could take up its own financial questions, it had to settle the business of the previous year. To make matters more complicated, these old accounts included large items which had gone on from year to year, principally in connection with the earlier attempts of the Union to recruit labour. These items laid a considerable amount of debt upon the Union which had to be dealt with. The Executive went into the whole question of finance and they found not only a confusing state of affairs, but that the Union had been run at a heavy loss from year to year. That was an extremely serious state of affairs. Personally he had a great horror of debt, and he thought the watchwords of every farmer should be "Thrift and Economy." If that applied to the individual, how much more so should it apply to the institution representing their combined interests. The

difficulty which presented itself to the executive was how were their debts to be wiped off? Expenditure was immediately reduced by one half, in fact the executive took up the attitude that if necessary it must stop altogether until the Union was out of debt. The result of this action has been that the balance sheet presented to you this year shows for the first time for many years a surplus of receipts over expenditure and a cash balance in hand. (Applause.) As far as possible they had placed their finances on a sound basis. Whilst he was on this subject there was one point in particular which made it necessary for them to consider seriously the question of finance, namely, their affiliation with the South African Agricultural Union. Comparing their Association with other Unions in South Africa, he found that, with the exception of the Transvaal Union, which was run in a very expensive way, they were in a better position than any other Union. They had certainly a larger revenue than the South African Union. Their revenue was derived as follows: A very liberal grant from the Government of £150 per annum, subscriptions amounted to between £200 and £300, and with that total the possibilities of the Union were great indeed, provided they did not fritter their money away in unnecessary expenses. They should conserve their resources for the most useful work they could think of; one of the most useful being the payment of the expenses, or part at least, of the expenses, of representative men to go to the different congresses of the South African Union. The proceedings of their meetings must also be properly reported and printed and spread throughout the country. Since the last meeting of the Union the first Congress of the South African Agricultural Union met at Cape Town. Before this there was the Inter-Colonial Agricultural Union. That Union aimed at being representative of the whole of South Africa, but for some reason or other the Orange Free State remained out. Since the political Union, however, the South African Agricultural Union had been formed, which included delegates from every province of the Union and also from Rhodesia and the Mozambique Territories. Rhodesia was specially invited to send representatives to the first Congress, but were only given half the voting power, namely, five delegates, whereas the other provinces were entitled to ten. It was thought that

Rhodesia should make a special effort to send down the full number of men allowed, but want of funds was the difficulty. The Administrator, however, kindly came to their assistance and on behalf of the Government contributed £100. Of course their delegates did not take a very active part on this occasion and were more in the position of visitors, but he might tell them that the visit did them an incalculable amount of good. They came in contact with the most prominent men in the agricultural world of South Africa. They had the opportunity of meeting and discussing matters with not only them, but with the leading agricultural and veterinary scientists. The S.A. Agricultural Union extended a warm welcome to the Rhodesian delegates and passed a special resolution to this effect, hoping they would take very prominent part in future congresses. A resolution was also passed giving them full voting powers and under this resolution Rhodesia was now entitled to send 10 delegates to the S.A. Agricultural Union Congress. He had specially brought up this matter in connection with finance as he considered they should make special arrangements this year to send down the full complement of delegates to the Congress being held at Bloemfontein. After the last executive meeting he had interviewed Sir William Milton, who said he would recognise the principal of contributing £100 towards sending down delegates to the congress. That £100 would about pay half of the expenses and if they husbanded their resources the Union should be able to pay another £100.

LABOUR.

From the earliest time they had been having difficulty in obtaining an efficient and regular labour supply. The present position had gradually grown up and had become more difficult every year. As they all knew Mr. Edmonds some years ago made a very strenuous fight on behalf of the Union, doing its own recruiting independent of the Bureau; but circumstances were against him, and he was forced to give up that idea and was practically forced by the Administration into the Bureau. When he surrendered, however, he surrendered conditionally. The conditions under which he gave way were that the Bureau should take over the liabilities and assets in connection with the recruiting carried on by the Union and that the Bureau should supply labour for the

farming industry at a capitation fee of 30s. per head. During last year the Bureau wrote requesting the Union to give up this agreement and to pay something on top of this 30s. The Union took up the standpoint that it certainly could not do so. The Bureau maintained that 30s. only just about covered the direct cost of recruiting, but did not cover the indirect cost; did not contribute towards their general manager, head office and other general expenses, and if the Union could give them another 6s. 6d. in addition to the 30s., it would be sufficient. At this juncture the scheme of the new Bureau was brought forward. They all knew the history of the articles of that organisation. These had been altered considerably from the original articles placed before the employers of labour in the country. When they first had information of the new Association, it appeared to them to be simply a Joint Stock Company, formed in London, to take over the labour of Rhodesia and practically get a monopoly. Among other things it was also to take over recruiting for farmers. The Executive of the Union met immediately and passed resolutions, which were forwarded to the Administrator, protesting against any limited liability company gaining a monopoly of the labour of Southern Rhodesia. The whole thing was then held in abeyance until more information arrived from London, and again put off until the arrival of Mr. Kempster in this country. After considerable delay and shelving of the matter a labour conference was held in Bulawayo. In connection with that conference he might tell them he had three days' notice; at all events he got a letter from the Commercial Representative of the B.S.A. Company in Bulawayo, asking him as President of the Union and as one of the heads of the farming industry in Matabeleland, to attend the conference on behalf of that province. Mr. Backhouse had a similar letter to attend in the interests of Mashonaland. That was the only representation farmers had at that conference. They went to that conference with no official appointment at all, and without time to consult and obtain proper authority from the farmers of the country. At the very commencement he entered a protest in connection with the short notice that had been given to the farmers, and he pointed out that, from their own figures of boys employed in the country, farmers should have five representatives instead of two. Then came the question of the report, and it

was unanimously decided that a verbatim report of the proceedings should be taken. The question of cost arose. The Chamber of Mines had provided £100 for the report, and it was thought this would not cover the cost. Enquiry was then made at the Argus Co., and the charge was put at about £150. It was distinctly understood that whatever the cost they must have a verbatim report, and that the money would be found. In spite of this, however, he had failed to obtain a copy of the verbatim report and was afterwards informed that it was decided not to publish it. Both Mr. Backhouse and he (the speaker) fought very hard for the interests of the farmers. Certain concessions were obtained and protests registered. He (the speaker) had distinctly given the Conference to understand that neither he nor Mr. Backhouse had any official status and although both were members of the Agricultural Union they had not been directly appointed, and, owing to the shortness of the notice given, had been unable to get in touch with the wishes of their fellow members. They had absolutely refused to take any responsibility for the farming community, and though they took part in the debates and made the best of their case they would not agree to one single thing in connection with these articles until they had called together the organisation which was really representative of the whole community. Immediately after the Congress was over a general meeting of the Agricultural Union was called. It was called at very short notice, because a definite reply was wanted before the Legislative Council sat. They all knew the resolutions which were passed at that meeting. It was then the articles were agreed to, and he thought they were all going to be loyal to that agreement and give the new Bureau every chance to turn out a success, but it was distinctly laid down that the agreement was conditional upon the new Bureau being able to supply boys at not more than £2 per head. That perhaps did not sound a very important matter, because few farmers would realise that a higher fee might be contemplated, but if they knew the trouble he had taken to try and get some idea from Mr. Kempster and other officials of the Bureau as to what farmers were to be charged for boys, and how the question had been evaded, they would realise the importance of such a condition to the farming industry. It had been said the capitation would be very high, some put it as high

as £4 10s. 0d., and even that, they said would not cover the capitation at first if the new organisation was to be put on a sound financial basis. The new labour ordinance was passed at the last session of the Council, and Mr. Kempster had gone home. They were now waiting again, and, in the meantime, they were all suffering severely from an acute shortage of labour. They must do something temporarily, but they would not know what was to be done towards a permanent solution of their trouble until Mr. Kempster returned.

COAST FEVER.

He regretted there had been a recrudescence of this disease in the country, particularly in Matabeleland. For some time they had been hammering away at the matter of precautionary measures. At the last conference, special resolutions were passed with regard to fencing, which gave the Government very extended powers in dealing with the disease. These were sent to the Government. When the disease threatened Bulawayo and that part of the country these resolutions were brought up by his (Matabeleland) Association, and when the disease got very serious the Government decided to call a special Session of the Legislative Council to put in force practically our resolutions and take advantage of this most liberal action on the part of the farmers. Those resolutions gave the Government the right to fence and charge the farmer with it provided the charge was spread over a period of years. The Legislative Council amended the Animals Diseases Ordinance to the effect that the Government could declare any area infected for the purpose of the Ordinance. They could then take the whole thing into their own hands, erect fences and dipping tanks, charging up the cost to farmers, except in the case where a fence did not border a man's farm. He considered that when these powers were given to the Government it did away with the very last excuse and obstacle against the erection of fences and dipping tanks in infected areas (Applause). But what happened? In the case of the Bulawayo outbreak, he was afraid the Government had not taken proper advantage of the powers vested in them. They had opened a correspondence with the Municipal Council on the question of ways and means, instead of going straight ahead with the work. The Government could not be

exonerated in these matters, and it was their duty at that Congress to bring this matter up.

WATER ORDINANCE.

They all knew of the Water Ordinance brought forward at the last Session of the Council, which had been postponed in order that it might be further considered by the country. That Ordinance was really a two-fold Ordinance. At first it appeared to be an irrigation ordinance, but it also dealt with what had come to be known as the "inner bank question." When Dr. Nobbs came into the country he realised at once, as a man of his experience would, how necessary it was to have an irrigation ordinance. Personally, he (the speaker) appreciated very much his decision. But there was the "inner bank question" which was so wrapped up in the question irrigation, that it was difficult to touch the one without affecting the other. He might touch briefly on the history of this matter though he had often done so before. It arose out of the fact that the pioneers of this country had the right for services rendered, to select farms in any part of the country, and these farms were often located with a river or a stream forming a natural boundary, and the South African custom would in these cases give the owner title up to the centre of the stream and full riparian rights. The Chartered Company, however, insisted that such farms should be described as being bounded by the "inner bank of stream," and refused to issue title in any other form. To the ordinary man he thought even this conveyed the idea of water rights. They went on with that feeling until about three years ago when there was a rude awakening. From an incident that occurred in the Legislative Council during the debate on the Mining Ordinance, it transpired that the "inner bank titles" carried no rights of any kind to water in boundary rivers. It appeared that the question was settled by a High Court case in the Cape Colony. The argument that prevailed being that if a farm was bounded by another piece of land it must be bounded by the nearest edge of that land, and similarly if it was bounded by the "inner bank" of a river it meant the nearest edge of that bank, which, of course, was the top. Therefore, the moment the farmers' cattle moved off the top on to the slope of the bank they were

trespassing on Chartered Company land. That was the question they had been fighting in season and out for the last three years, and he would like to say that he thought all through that the Administration were honestly in sympathy with them, but with the land, it was claimed to be a commercial concern, and as Mr. Maguire had said to him, they were asking a commercial company to do a very difficult thing, to give up part of an asset which was theirs under the existing laws. However, after three years they had been given a promise that the whole matter would be settled in favour of the farmers if this ordinance were passed. With regard to the Ordinance, from an irrigation point of view he had, when it first came out, gone very carefully into it, and compared it with the irrigation ordinances of the Transvaal, Swaziland and the Cape, and he had to admit it was a most useful ordinance and, he thought, very necessary to farmers. It facilitated irrigation and dealt with the many questions that might arise in connection with a farmer making a furrow, or storage for his water, especially where there were riparian owners, or taking water over other people's ground. In comparing the law he had found that in most cases it had been taken word for word from the Swaziland Ordinance and he would have preferred it having been taken from the Transvaal Ordinance. They must understand that Swaziland was in a most confused state. It was a concession ridden country. There were mineral concessions, water concessions, wood and farming concessions, in fact so mixed up were the various concessions that a commission was appointed to go into the matter. Also in Swaziland mining was practically the only industry. It would certainly seem to have been better if they had gone to the Transvaal for their irrigation ordinance. There the farming industry was protected in every possible way, but on considering the matter, he had come to the conclusion that the Swaziland ordinance was perhaps not entirely unsuitable for this country. There was a certain similarity between that old concession-ridden country and this. (Laughter.) As in Swaziland, so in Rhodesia, in the past everything had to give way to the mining industry, and even now it was not proposed that the Irrigation Ordinance would in any way interfere with the Mining Ordinance which would still be supreme. The Irrigation Ordinance would keep the balance between land owner, and land owner, and arranged

the division of water fairly between riparian owners and others. The Government in bringing forward this Ordinance, had, he considered, acted solely in the interests of the farming community, and irrigation, and on that score he thought they could accept it, and it would be well if, after discussing it, they would ask their members and the Government to put it through at the next Session of the Council. In regard to the promise made that if the Ordinance was passed at the last Session of the Council the question of the inner bank would be decided, he thought that promise would still hold good, and that the Directors intended to keep faith in the fullest way with them, and he would like the members of the Union to take that as an example of the value of hammering away at a subject. For three years they had been fighting this question of inner bank, and at last had met with success. (Applause).

MAIZE EXPORT.

This was a matter which more closely concerned Mashonaland farmers, and he was glad Mr. Mundy was with them as he might give them some valuable information on this subject. The only reason he mentioned this subject was that it appeared to him, from what he had seen in the report of the proceedings of the last Legislative Council, that Mr. Newton rather threw cold water on the question of exportation. His argument appeared to be to the effect that it was no good exporting mealies when the mining industry wanted them that it was better to let mealies increase and prices come down; to let them (the mines) have cheap mealies; and when too many mealies were produced, even at these low prices, then was the time to export them. That attitude towards the industry was not a bit of good, and the Government should give every facility for export, not only for mealies, but other products as well. If the door was closed to export it would mean a man would produce just as much as he required and he would be afraid to risk having a surplus, as he would have in a good year when mealies might be unsaleable without an outlet. He would have no inducement whatever to grow quantities and the whole country would suffer. Every facility should be given to an export, and no limit would then be put on a man's production. In fact, the more they grew for export the

better for everybody. That was the way the Government should look at the matter. The price of mealies should be controlled not by the mines in Rhodesia, but by the world's market.

TAX ON UNOCCUPIED LANDS.

During the Congress he intended to bring forward a resolution dealing with this matter (applause), and he trusted it would meet with the support of the farming community, whose great desire was to see the large tracts of land now locked up, either occupied by the owners or thrown open for settlement by others. He would deal fully with the matter later. In conclusion he urged the delegates to strengthen the Union in every possible manner, and so guard their own interests and the interests of the country. (Applause).

Common Ailments of the Horse

(CONTINUED FROM PAGE 382.)

By D. R. CHATTERLEY, M.R.C.V.S., Government Veterinary Surgeon.

STAGGERS is a general term which includes any condition which causes the horse to fall suddenly and be incapable of rising again.

This is generally due to the pressure of the collar or breast harness on the large vessels of the neck, which causes a congestion of the brain, or to the effect of the sun combined with work.

The symptoms are a sudden reeling gait and general falling, and the hind quarters are frequently paralysed. Some horses are very violent when down, others are quiet.

TREATMENT.—If the condition is due to pressure of the collar, remove the pressure. Keep the horse as quiet as possible, and apply cold water to the head and spine. After recovery give a purgative and soft feeding for a few days. Cases of staggers not due to the above causes are usually from brain disease, and the animal is best destroyed.

CHOKING.—Is the stoppage of something in the gullet which the animal has swallowed, and which is unable to pass down to the stomach. It frequently happens to a greedy feeder, fed on bran and carrots. In cattle it is usually due to roots.

The symptoms are those of great uneasiness and spasmodic attempts at vomiting, the head being drawn towards the chest and then suddenly shot out. In cattle, hoven (see page 381) rapidly comes on if relief is not afforded.

TREATMENT.—In the horse give small doses of linseed oil (about 2 ounces), walk the animal about and do not give any water to drink, for this may cause the obstruction to swell,

and will return through the nostrils if the obstruction is complete. After relief is obtained do not feed for twelve hours. In cattle the obstruction is removed by passing the probang, but care must be exercised in the operation, otherwise the gullet may be ruptured.

WORMS are very common in all animals and are a cause of loss of condition if in great numbers. The following powder may be given daily for a week:—

Take of—Santonine, 20 grains ;
Tartar Emetic, 1 drachm ;
Sulphate of Iron, 1 drachm ;
Powdered Gentian Root, up to 6 drachms ;

after which a dose of physic (5 drachms of aloes) should be given.

NETTLE RASH is frequently seen on the skin of the horse, occasionally all over the body, but usually on the side of the neck. It appears in the form of flat swellings, varying in size from a sixpenny piece to that of a saucer. It is a condition which makes its appearance very rapidly and usually disappears in the course of a few hours.

TREATMENT.—Damp the skin frequently with a solution of salt and water (one ounce to the pint) and give two ounces of Epsom Salts night and morning in the drinking water for one week.

STRANGLES is a fever of young horses, the prominent feature of which is an abcess which develops between the branches of the lower jaw. There is also fever, and in many cases the animals may be off their feed and get thin. The disease is very contagious.

SYMPTOMS.—Fever and swelling beneath the jaw. This swelling is at first hard and diffused, but within a few days it becomes prominent in the centre between the jaws and gets soft at the point. It then bursts and heals rapidly.

TREATMENT.—Isolate, feed the animal well, and pay attention to the state of the bowels, keeping them open. When the abcess has burst, or has been opened, the discharge must be destroyed, as the disease is contagious, and its prevention is the main thing to be attended to.

INFLAMMATION OF THE LUNGS.—Pneumonia may occur from the extension of a cold into the lungs, or may, especially among horses, arise without any visible cause, when it should be treated as a contagious disease and the case segregated. In outbreaks of Influenza among horses it is a somewhat common form for the disease to take.

SYMPTOMS.—The animal will probably be noticed dull and off its feed; there may be a history of a cold or a cough for a day or two previously: the animal stands still, the forelegs probably a little wide apart, the breathing is hurried, the pulse fast and the temperature high. The lining of the eye will generally be found a brighter red than normal, and the bowels are usually constipated. From day to day the changes to be observed are slight, the pulse remains fast and gets gradually weaker, the breathing remains hurried but may become more shallow, the temperature keeps high and the appetite is gone or capricious. After a few days the animal begins to get visibly thinner, and the wasting is so rapid that at the end of a fortnight many cases are skin and bone. A slight rusty-coloured discharge may be sometimes observed from the nostrils, and a painful cough is often a constant accompaniment. When the ribs over the lungs are struck with the tips of the fingers, the sound produced is duller than is natural.

TREATMENT.—In this disease, above all others, good nursing is necessary. The great thing is to coax the case to eat sufficient food to keep up the strength. Every variety of food may be tried to tempt the animal, and small quantities of different sorts should be left in the stable at night. Water should be kept within easy reach and changed whenever fouled. Warm enemas and green food should be frequently administered if the bowels are constipated, but physic balls are not to be given. If the case is weak a stimulant is beneficial, such as:—

Spirits of nitrous ether ...	...	1 ounce.
Aromatic spirits of ammonia ...	...	1 ounce.
Water ...	...	½ pint.

which may be given twice a day.

After recovery the animal should have a long rest in order that the lungs may regain their elasticity.

FEVER.—The symptoms of fever in all animals are similar: a high temperature, rapidity of pulse and breathing, generally constipation of the bowels and a scanty and high-coloured urine. In addition, shivering fits may sometimes be seen, and the coat stares, but usually these symptoms have passed before the case is noticed. Fever cannot be looked upon as a disease of itself: it is generally only one of the symptoms of a contagious disease which is causing it. For instance it accompanies cattle plague and other diseases.

Simple fever, that is a fever for which no definite cause can be found, may perhaps occur in the horse, and in such cases is generally an easy matter to deal with. Work, especially in hot climates, will cause the animal's temperature to rise temporarily, though it generally subsides quickly, and this is more particularly the case when the atmosphere is full of moisture and the sun's rays are severely felt.

The treatment of fever should include strict attention to the animal's comfort and the state of the bowels, this latter being, as it always is, extremely important, but physic balls should not be given. Warm enemas about blood heat may be administered two or three times daily when there is constipation. The food, if there is any appetite, should not contain more than half the usual quantity of grain which the animal receives, and may be given sloppy or cooked with advantage. Green food of any description may be given freely. Water should always be kept by the animal and frequently changed. It must again be repeated that the occurrence of fever in animals is usually the symptom of some other disease which produces the general symptoms just described in addition to those special to the disease.

LOCK JAW is caused by a germ which gains entrance to the body by wounds, and which is found in the ground. In some cases it appears in an animal showing no visible wounds and in such cases it is assumed that the germ is taken up by the animal whilst feeding and gains entrance to the system through some wound in the intestinal canal.

Usually it follows such wounds as pricks in the feet and broken knees, which come in contact with the soil. The symptoms are stiffness and constant spasms of the muscles of jaw (lock jaw), neck and back. The other muscles of the

body may be effected, but it is most noticeable in those mentioned. The jaws are fixed, the tail is drawn to one side and quivers. If the head is lifted up the haw or third eyelid appears, and the animal is very easily startled. The mouth is often seen covered with food from the patients attempt to eat, and this may be the first thing that draws attention to the case.

TREATMENT.—Keep the animal as quiet as possible. Separate from the others and away from any noise. Give a noiseless bed which is easy to walk about on, such as sawdust or old short litter; feed on plenty of soft sloppy food which the animal can easily suck down. Give at the outset a dose of physic, and, having put plenty of food and water within easy reach, do not allow anyone near the animal for twelve hours at a time. Absolute quiet is the best treatment. In all cases look for wounds and thoroughly cleanse them and treat with antiseptics. Cases which live over ten days usually recover if carefully nursed.

RINGWORM.—Round bald patches, covered with greyish scales about the size of a florin, common in all animals, and caused by a fungus growing at the root of the hairs, is contagious but not always serious. Clip off the hair round the patch, and dress with Iodine (ointment or tincture) both over and around the spot.

MANGE.—Is produced by small insects which live in or on the skin. It is found on all animals, and each class of animal has its own variety of itch insects. In the horse and mule there are two troublesome forms:—

1. The dry, produced by insects which live beneath the skin.
2. The moist, in which they are found on the surface of the skin.

SYMPTOMS.—In both cases the common situations for the disease to be first noticed are on the head, withers and back, and sometimes, but less frequently, the quarters. In the dry form small pimples may be felt as big as a pin's head, and from these the hair falls leaving a small pea-sized bald spot. In the wet form, a moist rapidly increasing patch will be seen from which the hair falls, and in both cases there is severe itching. If the place be gently scratched, the animals will

smack and nibble with the lips and lean and rub against the hand. When being groomed they will lean heavily against the brush, and when loose they will rub against anything rough with such violence as to make the skin bleed. When animals are well fed, groomed and clothed, it may not be so marked in its effects, but when work is hard and food scanty, animals rapidly waste and often die from constant irritation.

TREATMENT.—Isolation and strict disinfection. Clip off the hair and burn it, dress the case thoroughly all over every three days with the following lotion:—

Sulphur	...	...	6 ounces.
Oil of Tar	...	...	1 ounce.
Linseed Oil	...	...	1 quart.

well shake after using.

After the third application of this dressing well wash off with soap and water. Keep under observation for three weeks and, if necessary, apply the dressing again. Keep the animal well fed. All rugs, blankets and harness should be soaked in a disinfectant before being used again.

CRACKED HEELS AND MUD FEVER occur in the horse and the mule from the skin of the heel or belly being "chapped." The surface is hot and painful, and a greasy discharge exudes from it (greasy heels). When severe the animal is frequently very lame, especially on first moving. The causes are washing and not thoroughly drying the legs, and sometimes constant standing on wet sloppy ground, in which case sores may frequently be found on the bulbs of the heel in addition.

TREATMENT.—Thoroughly cleanse and dry the skin. If the greasy discharge is abundant, poultice with dry bran, boric powder, boric vaseline, or a lotion such as:—

Sugar of lead	...	...	1 ounce.
Sulphate of zinc	...	I	"
Water	...	...	Up to 27 ounces.

and place a pad of tow and a bandage lightly over the part treated. Give regular exercise to keep the skin supple while the cracks are healing. These injuries are preventable, and in the great majority of cases are due to neglect.

The Manuring of Tobacco on Mr. L. Black's Farm, "Stapleford," Salisbury.

By G. N. BLACKSHAW, B.Sc., F.C.S., Government Agricultural Chemist.

During the past season (1910-11) a tobacco manurial experiment, which will doubtless be studied with much interest by those in any way associated with the tobacco industry, has been conducted on Mr. L. Black's farm, "Stapleford," for the purpose of acquiring information in regard to the effect of various fertilisers upon the yield of leaf.

It is only by field trials that the value of any fertiliser upon a particular type of soil can be determined, and, in order that the effect of seasonal variations from year to year may be taken into account, and the experimental error, which is bound to occur, may be reduced to a minimum, these trials should be conducted for several years. Nevertheless, the results obtained in a manurial experiment, which has been conducted for one year only, certainly afford a large amount of information of practical value, and suggest further experiments from which deductions of still greater economic value may be drawn. When considering the practical conclusions of a manurial experiment, one has not to lose sight of the fact that they are really only applicable to the particular type of soil on which the trial has been conducted, proving thereby the need of conducting such experiments locally.

On Mr. Black's farm the stand of tobacco was particularly good throughout. The season on the whole was very good. As regards rainfall, a return of which is given below, nothing particularly abnormal occurred beyond a dry spell during the month of April, followed by an unusually heavy fall in May.

RAINFALL RETURN ON "STAPLEFORD," SEASON 1910-II.

1910—October	...	1.89 inches.
November	...	1.51 "
December	...	3.41 "
1911—January	...	7.63 "
February	...	7.14 "
March	...	4.14 "
April	...	0.67 "
May	...	4.54 "
		<hr/>
		30.93 "
		<hr/>

THE EXPERIMENTAL AREA.

The virgin soil selected for the experiment—a very light sandy loam of the Mechanical composition given below—was not broken up until the end of September; in November it was cross ploughed, cultivated and ridged up with a double mould-board plough, the tops of the ridges being about 12 inches across.

Mechanical Composition of Soil from Experiment Area on "Stapleford," Salisbury, Season 1910-II.

	First 9" from Surface. <small>$\frac{9}{16}$</small>	Second 9" from Surface. <small>$\frac{9}{16}$</small>
Coarse Gravel (over 3 m.m.) ...	2.00	5.27
Fine Gravel (1-3 m.m.) ...	4.47	3.73
Coarse Sand (.2-1 m.m.) ...	42.57	36.34
Fine Sand (.04-.2 m.m.) ...	41.57	43.76
Silt (.01-.04 m.m.) ...	0.14	0.11
Fine Silt and Clay under .01 m.m. (by difference) ...	4.62	6.19
Total loss on ignition (water and organic matter) ...	4.61	4.57
Calcium Carbonate ...	0.02	0.03

Hester Tobacco, planted three feet apart each way, was grown on the experimental area, and the fertilisers used on the various plots were as follows:—

TABLE I.
THE FERTILISERS USED IN THE EXPERIMENT AND PRICES.

Fertiliser.	Manurial constituents present				Price per ton (2000 lbs) at Salisbury.		
	Nitrogen.	Phosphoric oxide.		Potash.			
		Soluble in water.	Insoluble in water.				
	%	%	%	%	£	s.	d.
Nitrate of Soda ...	15	—	—	—	17	10	0
Double Superphosphate ...	—	42	4	—	16	12	6
Sulphate of Potash	—	—	—	50	18	10	0
Safco Double Complete ...	8	20	4	10	23	10	0
Safco Tobacco Fertiliser ...	3	9	3	11	14	0	0
Fison's Tobacco Fertiliser ...	1 ⁴ / ₅	4 ³ / ₅	3 ³ / ₁₀	⁴ / ₅	17	10	0
Albert's Tobacco Fertiliser ...	10	9		38	32	0	0

The plots, each of which was one-tenth acre in size, were planted with tobacco from the seed beds between the 5th and 9th of December, and the fertilisers applied by hand around the plants on December 13th. (On the plots receiving Nitrate of Soda, half the quantity—50 lbs.—was applied on December 13th and the remaining half on February 17th.) The blanks which occurred on the plots were replanted on 9th and 10th December and again on January 2nd. Topping and suckering was done on February 10th.

PLAN OF EXPERIMENT.

The details of the manurial dressing applied to each of the plots, and the yield of leaf obtained are given in Table 2. The questions put to Nature were the following:—

1. What is the effect of supplying a single plant food.—Answered in Table 2; plots 3, 4 and 5.
2. What effect has the application of a "Complete Dressing"?—Answered in Table 2; plot 9.
3. What is the result when one ingredient is withheld?—Answered in Table 2; plots 6, 7 and 8.
4. What is the return obtained from various proprietary manures applied in dressings costing the same amount per acre?—Answered in Table 2; plots 10, 11, 12 and 13.
5. What is the effect of an application of kraal manure?—Answered in Table 2; plot 2.

TABLE II.

Effect of Fertilisers upon yield of Tobacco per acre at
 "Stapleford," Salisbury, Season 1910-11.

Plot.	Manure per acre.	Cost of dressing per acre.	Yield of cured leaf per acre. lbs.	Increase per acre. lbs.
1	No Manure	—	396	—
2	6 tons Kraal Manure ...	—	356	- 40
3	100lbs. Nitrate of Soda ...	17/6	363	- 33
4	100lbs. Double Super-phosphate	16/7	*See foot note	- 4
5	40lbs. Sulphate of Potash	9/3		
6	100lbs. Nitrate of Soda ...	34/1	*See foot note	
	100lbs. Double Super-phosphate			
7	100lbs. Nitrate of Soda ...	26/9	517	121
8	40lbs. Sulphate of Potash	25/10	737	341
	100lbs. Double Super-phosphate			
9	40lbs. Sulphate of Potash	43/4	847	451
	100lbs. Nitrate of Soda ...	43/4	792	396
	100lbs. Double Super-phosphate			
10	40lbs. Sulphate of Potash	43/4	583	187
	310lbs. Safco "Tobacco" Fertiliser	43/4	702	306
11	250lbs. Fison's "Tobacco" Fertiliser	43/4	851	455
12	135lbs. Albert's "Tobacco" Fertiliser	43/4		
	184lbs. Safco "Double Complete" Fertiliser ...			

*A portion of the leaf from No. 4 was baled by mistake with a portion of that from No. 6, and in consequence, the yield per acre on each of these plots cannot be given. The average yield from the two plots was 721lbs. per acre.

The application of a single plant food on plots 3 and 5 (Nitrogen on the former and Potash on the latter) had no effect upon the yield of leaf obtained; in fact the returns of the two plots were lower than on the plot to which no manure was applied, the differences were, however, within the limits of experimental error which under ordinary farming conditions may be taken to be about 10 per cent. The conclusion cannot therefore be drawn that Nitrate of Soda and Sulphate of Potash applied alone had a harmful effect on the crop for the same variation might have been seen had the three plots, Nos. 1, 3 and 5 been treated exactly alike; the results, however, indicate that the yield of tobacco is not increased to any extent, if at all, when either Nitrate of Soda or Sulphate of Potash is applied alone.

It is unfortunate that the yield of plots 4 and 6 cannot be recorded separately, because Superphosphate markedly improved the growth of the tobacco even when applied alone, as will be seen by the fact that the average yield from the two plots was 721 lbs. per acre.

The best returns were obtained on the "Complete Dressing," plot No. 9, and the "Safco" Double Complete, plot No. 13, an outlay of 43/4 on each of which produced an increased yield of 451 and 455 lbs. per acre respectively.

On plots 6 and 8, where one manurial ingredient was withheld the effect of Superphosphate in improving the return per acre was again very manifest.

On plot No. 2 the kraal manure was only applied and turned under a week before the tobacco was planted out from the seed bed, so that it was not given quite a fair trial; in the circumstances, however, it had no effect upon the yield of tobacco obtained, the lower return when compared with the "no manure" plot being just within the limits of experimental error.

THE QUALITY OF THE LEAF.

The cured leaf obtained from each plot was submitted to Mr. Rice, of the Tobacco Warehouse, Salisbury, who reported upon its quality as follows:—

Report of the Manager, Tobacco Warehouse, Salisbury, on the quality of the leaf obtained from each plot.

Plot.	Colour.	Average length of leaf in ins.	Quality.
1. No Manure	Only fair (varying from yellow to dark brown)	12	Poor
2. Kraal Manure	Do.	12	Poor
3. Nitrate of Soda only	Slightly inferior to no manure plot	12	Poor
4. Superphosphate only	Very satisfactory bright	15	Very fair
5. Sulphate of Potash only	Similar to Nitrate of Soda plot	14	Poor
6. Nitrate of Soda & Superphosphate	Good bright yellow	14	Fair
7. Nitrate of Soda & Sulphate of Potash	Very fair	14	Fair
8. Superphosphate & Sulphate of Potash	Good bright yellow	14	Very fair
9. Nitrate of Soda, Superphosphate and Sulphate of Potash	Good, bright lemon yellow	16	Good: shape of leaf very satisfactory
10. Safco Tobacco Fertiliser	Very fair	14	Fair
11. Fison's Tobacco Fertiliser	Very fair	14	Fair
12. Albert's Tobacco Fertiliser	Very fair	14	Fair
13. Safco Double Complete	Good bright lemon yellow	15	Similar to No. 9

General Note.—The leaf of plots 9 and 13 is much superior in quality, colour and general spread to that of the other plots.

(Sgd.) W. A. RICE,
Manager, Tobacco Warehouse.

PRACTICAL CONCLUSIONS.

NOTE.—*When considering these deductions, due regard must be given to the fact that they are drawn from the results of one season only.*

1. That fertilisers containing Nitrogen or Potash only, when applied alone have little, if any, effect upon the yield of tobacco.
2. That Superphosphate markedly increases the yield per acre.
3. That the best return on the virgin soil under experiment was obtained by applying a "complete dressing," *i.e.*, one containing the three manurial ingredients—Nitrogen, Potash and Phosphoric oxide.
4. That the best return per acre and the best quality of leaf was obtained from those complete dressings which contained a relatively high proportion of Phosphoric oxide.

Acknowledgments.—To Mr. L. Black and his assistant, Mr. Cradock, also to Mr. Rice, of the Tobacco Warehouse, special thanks are due for the time and care which they have devoted to this experiment; without their hearty co-operation the information contained in this report could not have been presented.

A Note upon the Method of Applying Fertilisers for the Tobacco Crop.

By G. N. BLACKSHAW, Government Agricultural Chemist.

The Common Rhodesian method of applying tobacco fertilisers at the present time is that of placing the manure around each plant by hand. This being a somewhat expensive and comparatively slow process, a small trial with a single row fertiliser drill was carried out at "Stapleford" during the past season. The machine used was an ordinary single row maize drill with fertiliser attachment, and the fertiliser was applied a day or so before the tobacco was planted out from the seed bed.

Mr. Black reports upon the "drill method" of applying the fertiliser as follows:—

"With reference to the single row fertiliser drill, lent to me by the Agricultural Department last season, I have pleasure in stating as follows: I used the implement on about five acres of land that had been prepared for tobacco by ridging with a double mould-board plough, and found that a perfectly even distribution of about 200 lbs. per acre was given when the fertiliser was dry.

"I should certainly have used the machine for my whole crop but for the fact that the 'Safco' supplied last season was very damp and lumpy, necessitating constant cleaning out of the hopper as the 'Safco' worked into a paste after a every few rows. I had several bags dried in the sun on sheets of iron and the lumps broken down, and found that when prepared in that way there was no difficulty whatever in going steadily on.

"The tobacco plants set out on the land thus treated seemed to strike more quickly and grow more evenly than on that fertilised by hand, which is a decided advantage."

"Should I be able to procure the fertiliser in good dry condition, I shall use one of these drills for the whole of my tobacco crop during the coming season."

The reason for the fertiliser working into a paste so rapidly was doubtless largely due to its very damp condition, but with a mixture containing Superphosphate (most of the proprietary manures, "tobacco fertilisers" for example, do) or dissolved bones as one of its ingredients, any machine which has moving parts working in the manure will gradually cause the formation of a paste and clog up the machine. When buying a fertiliser drill, therefore, one has to remember that the less the actively moving parts come into contact with the manure the more suitable it is for the application of a mixed fertiliser.

Corrections in Plan and Specification— Tobacco Barn.

FOR ALL BARNS.

Inside intermediate runners should be 3in. x $1\frac{1}{2}$ in., not $1\frac{1}{2}$ in. x $1\frac{1}{4}$ in.

Roof ventilators should be 2ft. x 1ft. 6in., and should be as near as possible to the ridge of the Barn.

“Gable Ventilator” should read “Gable and Ground Ventilator.”

Cement for single barn is 2 casks instead of 4; for double barn and packing shed 8 casks instead of 16, and for four barns and packing shed 12 casks instead of 24.

FOR BLOCK OF 4 BARNS.

From wall plate to ridge in roof should be 6ft., not 11ft. 6in. as shown on plan.

Iron sheets for roof should be 72, 11ft.; 22, 10ft.; and 22, 9ft.; instead of the Quantities given.

Roof timbers 30, 18ft. Tie-beams; 50, 11ft. Struts and Rafters on small principles; 15, 19ft. Struts and Rafters for principles shown on Section A.B. 2, 14ft. for Valley Rafters.

All timbers $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in.

Soy Beans.

By R. H. B. DICKSON, Government Agriculturist.

Of recent years a good deal has been heard of the Soy or Soja bean (*Glycine hispida*), and efforts have been made to extend its cultivation in Africa and elsewhere. The crop has already obtained a firm hold in the United States, where many varieties suitable to the different climatic conditions are grown. It seems likely that some of these will suit Rhodesian conditions and it is hoped that further trials with American seed will be made this year.

The Soy bean is a native of China, Japan and Java, and from these countries has been comparatively recently introduced into India, Europe and America. It is a strong erect growing plant, ranging from one to four feet in height, with many branches like a miniature tree. The foliage is heavy and thick, and the plant branches and fruits close to the ground; this latter peculiarity renders harvesting by machinery rather a difficult matter. The plant is covered with rusty hairs. The flowers are small and inconspicuous, white or purple in colour, and are found close to the stem at the base of the leaves. The pods are small, two to three inches long, and contain from one to four beans, which in most varieties resemble the marrow-fat or garden pea as far as shape and size are concerned, but which vary greatly in colour, being black, yellow, brown, green or mottled. The root system consists of a long tap, connected with many lateral roots, thus enabling the plant to withstand drought. The plant matures in from 90 to 150 days, the time depending on the variety. One of the worst features of some varieties is the habit of shedding the grain as soon as the pods are ripe, which renders harvesting for seed almost impossible. With such varieties, however, pigs may be turned into the standing crop to feed it off, thus saving the cost of harvesting. In any case pigs should always be allowed access to fields where this crop has been grown to glean the grain which is shed in the process of harvesting.

Soil and Climate.—The Soy Bean is best suited to sandy or light clay soils, and does least well on a black clay loam. It withstands dry spells well, and also seasons which are unusually wet, and speaking generally, it should grow in all soils and climates suitable for maize growing.

Planting.—The land must be better prepared than for maize. A good tilth is necessary, and the land must be well harrowed to kill as many weeds as possible before planting. The crop can then be produced with little after cultivation. As Soy Beans may be grown either for hay or grain production, distance of planting varies, but in either case drilling is preferable to broad-casting. The seed then germinates more uniformly and all plants are ready to be cut at the same time. It is advisable not to plant until January, so that harvesting may take place in the dry season. Maturity occurs in from 90 to 150 days after planting, the time depending on the variety grown so that choice of variety in reality governs the time of planting. If intended for hay the drills may be from 6 to 15 inches up to 24 inches apart, in which case 50—70 pounds of seed are required per acre. When grown for grain production, rows 24 to 30 inches apart give the best returns, and the seed is sown 2 to 4 inches apart in the row. From 35 to 45 lbs. of seed is then required per acre. The seed can be sown with a maize planter using small plates. Those used for kaffir corn are suitable. On no account should the seed be planted more than two inches deep, and one inch is preferable. Until the beans are four to six inches high, they may be harrowed and afterwards cultivated, as long as the plants are not damaged. Weeds will cease to grow as soon as the beans reach across the rows. Soy beans are sometimes planted with maize in the same way as are cowpeas. The best method is to sow alternate drills or alternate series of two rows each of maize and soy beans. This latter is done by filling one box with maize and the other with soy beans, and the former by filling both boxes with beans and straddling the rows of maize when these appear above ground, or drilling single rows of beans between the rows of maize at the last cultivation. Where the soil is very poor it is advisable to plant the rows of maize four to six feet apart and to grow soy beans, cowpeas or peanuts between the rows. The latter enrich the soil and do not interfere with the growth

of maize. Where maize and soy beans are planted together, both may be harvested for silage. At present prices it is probably not a practical proposition to apply any fertiliser to the soy bean crop. If however, any lime or wood ashes are available, an application of 2 or 3 cwt. per acre is likely to prove beneficial.

Harvesting.—Cut as soon as the pods are well formed and before the leaves fall. When the lowest leaves become yellow the crop must be reaped at once if required for hay. It can be cut later for grain, provided that the pods do not split. The plants may be pulled up by hand and laid in rows to wilt and then bound loosely in bundles and shocked, or they may be cut with a mower if the ground is sufficiently level to allow the knife to be set so low as to avoid cutting the pods. After lying in the swath until the leaves are well wilted, but before they become dry and brittle, the plants may be raked into windrows, and then put in small cocks or bunches and finally stacked. Curing frames consisting of three or four poles in the shape of a pyramid, round which the hay is built up, may be used to allow of free circulation of air.

Threshing.—As with many other crops in Rhodesia, the difficulty and expense of threshing may prevent the crop being largely grown. Threshing by hand on a bucksail or large flat stone is very expensive, costing somewhere about 2s. 6d. per bag of 200lbs. A machine called "a cowpea huller" is used in the United States for threshing soy beans and cowpeas. It may be either hand or power driven, and is made in various sizes. Enquiries as to cost, etc., are now being made in America. Storing the seed after threshing is rather a difficult matter as the beans heat and spoil—if stored in large quantities—and they must be stored in small bins, sacks or thin layers, and the air allowed to circulate through the mass.

Yield.—The soy bean has produced about 5 bags or 16 bushels to the acre in Natal, but so far its results have not been very successful in Rhodesia. The yields in the United States for the better varieties range from 25 to 40 bushels or 7 to 12 bags. The usual yield of hay is $1\frac{1}{2}$ to 2 tons per acre depending on the variety.

Varieties.—There are at the present time some 300 known varieties of Soy Beans, and these have been divided into

groups according to various characters. Until recently the colour of the seed and the length of time taken to mature have been the governing factors in separating them into groups, but latterly the shape of the plant and value of the foliage for fodder have been taken into consideration as well. Of five varieties introduced into Rhodesia by the writer, two or three give promise of being of some value. The best are the Brown, the Mammoth Yellow and the Hollybrook, of which a brief description follows :—

Brown.—Plants stout, erect, bushy, 24 to 30 inches in height, maturing in 130 to 140 days. Flowers purple, pods shattering little, seeds brown. Should yield a fair amount of hay.

Mammoth Yellow.—Plants like the Brown variety though not so large and vigorous, 18 to 24 inches high, maturing in 130 to 140 days. Flowers white, pods holding seed well, seeds straw coloured. Can only be grown for grain or hay.

Hollybrook.—Plants not so large as the Mammoth, being 15 to 18 inches high, maturing in 110 to 120 days. Flowers white, seeds straw coloured, very similar to the Mammoth. This variety produces a large number of pods, but is too woody to make good hay.

Soy Beans as a Foodstuff.—Soy Beans constitute one of the richest natural vegetable foods known. For comparison with other foods the following table is given :—

Food.	Percentage of digestible nutrients.		
	Protein.	Carbohydrates.	Fat.
Maize ...	8.0	66.7	4.3
Oats ...	9.2	47.3	4.2
Bran ...	12.3	39.2	2.6
Cotton Seed ...	37.8	16.9	12.2
Linseed Meal ...	29.3	32.7	7.0
Soy Beans ...	29.6	22.3	14.4

Soy Beans can be fed to any animal without ill effects, though stock, with the exception of pigs, do not relish them much at first. The grain is too rich in protein to be fed by itself, and four or five parts of maize, or its equivalent, should be fed to one part of Soy Beans.

Various feeding experiments have been carried out in America to ascertain the cheapest rations for fattening pigs.

The following results obtained with pens of three pigs are of interest :—

I—Ration	Daily gain per pen.
Maize meal only	2.18 lbs.
Equal parts of maize and wheat middlings	4.35
Two parts of maize meal to one part of soy bean meal	4.78

II—Two lots of pigs 7½ months old, weighing 188 pounds each, were fed for 7 weeks, one lot on kaffir corn meal only, and the other on four parts of kaffir corn with one part of soy bean meal :—

	Kaffir Corn only.	Kaffir Corn and Soy Bean Meal.
Average gain per pig	90.6 lbs.	103.8 lbs.
Gain per bushel fed	11.9	13.9
Feed required for 100lbs. gain ...	472	409

Reference has been made above to the practice of turning pigs into a field of soy beans and allowing them to harvest the crop. This is especially profitable when maize or kaffir corn is fed in addition to beans, and it also does away with the difficulty of harvesting when labour is scarce, and produces a beneficial effect on the soil. Pigs can be turned into the beans when the pods are nearly full of grain, but before they begin to ripen. It was found that it cost nearly 32s. to produce 100lbs. of pork when only maize was fed, but that when two-thirds the amount of maize was fed and soy beans were pastured in addition, the cost was reduced to about 11s. 6d. per 100lbs. of pork.

By Products.—Soy beans contain from 19 to 22 per cent. of oil and are largely imported into England, where the oil is extracted. During the present year, the price for soy bean oil has ranged from £29 to £35 per ton. The residual cake is a most valuable cattle feed, and is in good demand on the English market at about £7 5s. per ton. Messrs. Lever Bros. of Durban, Natal, are interested in the production of oil from soy beans, and are offering 10/3 per bag of 200lbs. f.o.r. at Durban. Compared with the returns obtainable from feeding off the crop, thus maintaining the soil fertility on the farm, these prices do not offer much inducement to farmers to export.

Notes from the Agricultural Laboratories.

ENTOMOLOGICAL.

A COMMON PEST IN AN UNUSUAL ROLE.—During May of this year the writer's attention was called to a beetle which was working in freshly baled tobacco in Salisbury, and doing very noticeable damage. On examination the beetle was found to be *Triboleum confusum*, a "Darkling" beetle of world-wide distribution. This species has long been known as a pest of various dried vegetable and animal substances, but tobacco is undoubtedly a very unusual food for it, and may even be a new one.

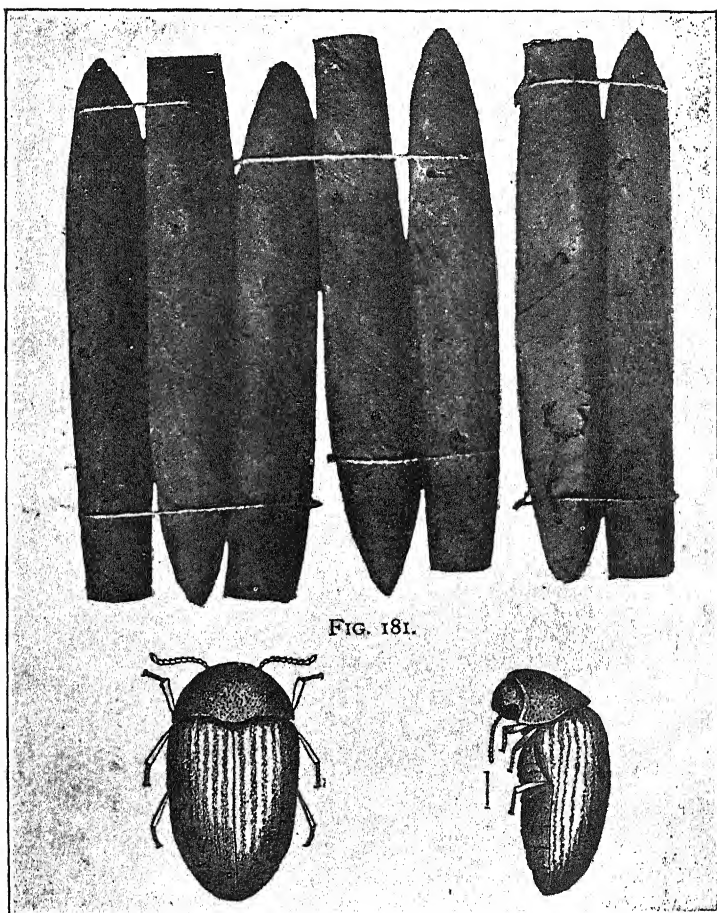
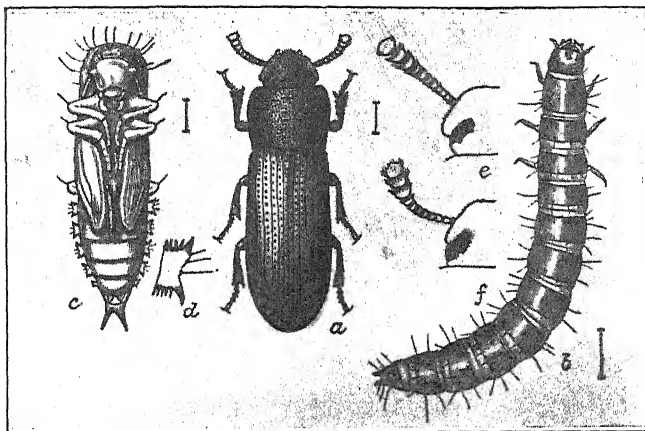
Fig. 1 of the accompanying plate is a reproduction shewing the adult beetle (a), the pupa (c), and the larva (b). The actual length of the insect is indicated by the small line by its side. The colour of the adult is dark reddish brown, the larva being whitish and rather hairy. The eggs are laid amongst the food of the larva and adults. It may be mentioned that although the adult beetle thrives on a diet of tobacco leaf, it has yet to be shown that the insect will reproduce itself successfully under such conditions. The larva has not yet been found in tobacco, and as the store where the leaf was attacked had contained bags of maize for several months beforehand, there is considerable doubt on the subject. An experiment is being made to settle this point. Amongst other substances *T. Confusum* has been bred from stored grain, meal, flour and dead and dried insects in museums, etc. Methods of destruction in tobacco will be similar to those adopted for the destruction of the cigarette beetle (see the following note).

THE CIGARETTE BEETLE.—The insect known as the *Cigarette Beetle* (*Lasioderma serricornes*) is almost cosmopolitan and flourishes in this territory, where it is the cause of much anxiety to the managers of tobacco stores. The adult insect is shown in the adjoining plate (Fig. 2), the actual size being indicated by a line. Its colour is dark reddish brown. The

larva is white, stumpy in form, and curved. It attacks tobacco in all its forms. The illustration shows the results of its attacks on cigars. Although the plate is a reproduction, the writer has a quantity of cigars in his possession which might have stood for the model of those illustrated. These were attacked by the beetle in Salisbury. The beetle readily attacks baled tobacco and injures the outside leaf very much, though rarely penetrating more than a few inches from the surface.

The usual remedy adopted for this pest is fumigation with *Bisulphide of Carbon*, a volatile liquid giving off a highly poisonous, penetrating and, when mixed with air, explosive gas. The material to be treated is placed in an air-tight room and opened up as much as possible. One pound of carbon bisulphide is generally used to each 1,000 cubic feet. It is volatilized simply by placing it about the room in shallow vessels. The doors are shut and kept so for 36 hours, when the building is opened up and aired before anyone enters. As a rule, the most convenient time to charge the chamber is at noon on a Saturday, so that it can be opened up early on Monday morning. The greatest care must be taken that no one approaches the chamber with a light, as otherwise a disastrous explosion may be the result. With proper care, however, the work can be carried out without danger.

The labour of opening up a large number of bales of tobacco for treatment with carbon bisulphide involves very heavy expense, and it is interesting to learn that this and allied pests can be destroyed by another agent, which in the case of Virginia leaf can usually be economically applied in the factory. This agent is heat, the economic value of which in connection with the destruction of pests of stored products has recently been demonstrated by George A. Dean, in the *United States Journal of Economic Entomology*, April, 1911. Although Mr. Dean's experiments are not complete, one fact has been conclusively shewn, and that is that *T. confusum* will in no stage live in a temperature of 130°F. for very long, and although experiments were not made with *L. serricornis* it is unlikely that this species will prove noticeably more resistant. In the steam chamber of a Virginia tobacco factory then there is an opportunity to cleanse the tobacco bales of their insect inhabitants, as a heat of 130°F. can be maintained there for a



The Cigarette Beetle.

period of several hours. As insects in stored materials have a tendency to seek the open when subjected to an uncomfortable temperature, and the eggs that have been tested have died at a lower temperature than the adults, the heat would only need to be maintained long enough to raise the innermost eggs to a temperature of about 120°F., when the adults in their anxiety to escape would seek the fatal temperature nearer the surface of or outside the bale. An exposure of the bales for six hours in a chamber heated to 130°F. should be sufficient, but there is no difficulty in maintaining the temperature for a long period. This method promises to be very useful and will be followed up.

THE MALLY FRUIT FLY REMEDY.—The ravages of the Fruit Fly are heavy in this territory. The following remedy, due to Mr. C. W. Mally, now Acting Cape Entomologist, has proved of great value in the Cape Province, and is worthy of a trial under Rhodesian conditions, though our heavy summer rains will probably prove a handicap against its success.

The basis of the remedy is the fondness of the adult flies for anything sweet. The method lies in placing sweetened poison in such a way as to attract and kill the great bulk of the flies before they have time to deposit their eggs. The following formula has proved successful :—

Arsenate of Lead	...	4 ozs.
Black Sugar	... ..	3 lbs.
Water	... ..	5 gal.

The sugar is dissolved in cold water and the Arsenate of Lead thoroughly mixed. A common garden syringe has been found the most convenient instrument for applying the poison. One syringeful is discharged upwards to fall in a shower over each as the operator walks round. The finest slightly convex rose does the work best. The work should be commenced before the earliest apricots ripen and continued throughout the fruiting season. The application should be renewed every ten days to a fortnight in the dry weather and after every heavy rain. It is the fact of the poison washing off the leaves during a rain shower that may render the method unsuccessful in Rhodesia. However, the original experiments were carried out in the Eastern Province of the Cape Colony, where summer rains also occur, and

the results were most striking. An always badly infested peach orchard was taken in hand when a considerable portion of the fruit was already infested and the fruit was allowed to lie and breed flies on the ground. An orchard about 400 yards away acted as a control, and possibly as a reservoir for new flies. The results were that in the treated orchard the late fruit matured with less than one per cent. magotty, whilst in the control orchard practically all the late fruit was infested. Those who annually lose the greater part of their stone fruits in Rhodesia from Fruit Fly will do well to try poisoned bait.

EXPLANATION OF PLATE.

FIG. 1—*Triboleum confusum*.—(a) Adult, (b) larva, (c) pupa, (e) head with antenna, (f) same of *T. ferrugineum*.
From J. B. Smith's "Economic Entomology."

FIG. 2—*Lasioderma serricorne*.—Adults and cigars, showing injury.

From J. B. Smith's "Economic Entomology."

Notes from the Poultry Yard.

SELECTION OF STOCK

BY H. FRANKLIN

In order to secure the greatest possible return from poultry it is necessary to raise them to the highest standard. This can only be perfected by breeding from pure bred males who have recognised qualities which will be reproduced in their offspring. Mongrel cocks on the other hand have no fixed qualities, and for this reason attempts to grade up from these sires will for the most part result in failure.

There are three classes which come under the heading of Profitable Poultry, comprising general purpose or utility, laying and table birds. To establish any one of these the first care should be the selection of a high class male; an inferior bird will invariably give poor results even if mated with tip top hens.

The male is the foundation of the pen; quality comes from him, any weakness or defects he possesses will be reproduced in his stock: therefore he must be of a sound constitution, well developed and vigorous. If a young bird is desired a lanky instead of a short, cobby one should be chosen, because a lanky bird may turn out well, whereas a short, cobby one will never attain any great size.

It is money well spent to pay as much for the male bird as means will allow, even if by so doing the number of hens must necessarily be cut down.

GENERAL UTILITY.—Poultry stock should be of a quick growing, large bodied type, that will build up a frame at small cost, and at the same time will be fair egg-producers. Though not quite so prolific as the non-sitters, or laying class, this type of bird is disposed to lay better in winter,

and though not so good as the table bird in meat qualities, they are better layers, and also make more marketable or larger chickens than do any of the non-sitting breeds.

The favourite breeds under this heading comprise Wyandottes, Orpingtons and Plymouth Rocks.

THE WYANDOTTE is smaller than the Plymouth Rock, but is an equally rapid grower, and is among the best of any breed. As layers they rank equal with the Plymouth Rock. There are a variety of colours—silver, golden laced, and the latest production, the White Wyandotte, which has, perhaps, gained the most popularity. A new strain—the Buff—is already coming into recognition. Weight: Cock, $8\frac{1}{2}$ lbs.; hen, $6\frac{1}{2}$ lbs.

THE ORPINGTON is larger than the Plymouth Rocks, and ranks among the first-class as an egg-producer at all times of the year. As a table bird the Orpington, though not the finest, is very good. The colour of the flesh is white. Its only advantage over the White Wyandotte. Like the Wyandotte they mature slowly, the pullets coming on to lay at from 8 to 9 months. The favourite variety is the Buff, a cobby, compact bird. Thighs and legs short, the latter white or pinkish. Plumage, lemon to deep buff. The White Orpington is also an excellent bird, and as layers the breed is rapidly coming to the front. Weight: Cock 10 lbs.; hen 8 lbs.

THE PLYMOUTH ROCKS.—The fattening qualities and size principally recommend this breed. As pullets they lay well, but are inclined to drop this quality for fat as they grow into yearling hens. They are not popular in Rhodesia for this reason, making them prone to liver disease. Weight: Cock, $9\frac{1}{2}$ lbs.; hen, $7\frac{1}{2}$ lbs. Colours: White, buff and barred.

THE EGG-PRODUCING CLASS.—The Mediterranean breeds have proved their superiority here, and their popularity may be said to be divided between the Leghorn, Minorca and Andalusian breeds.

LEGHORNS are small and highly nervous birds. Favourable conditions, such as warmth and proper attention, are necessary to keep this class up to its best standard. In

confinement, 9' wire netting is necessary to keep them enclosed on account of their tendency to take wing. The most popular and best established breeds are the white and brown.

MINORCAS are larger than the Leghorn and lay the largest eggs of any breed. They also mature early. The principal varieties are the black and white.

THE ANDALUSIANS are ideal farmers' fowls—better winter layers than the Minorcas. They thrive well in confinement and are industrious foragers, quite capable of looking after themselves in finding food on the farm.

All three breeds are hardy and consistently good layers of fair sized, white shelled eggs; being non-sitters their re-production requires an incubator or use of a broody hen of one of the sitting varieties. To establish a strain in this class the selected stock should be the progeny of a prolific strain, of whose antecedents some knowledge should be obtained previous to purchase. It is advisable to pay a fair price and purchase from a reliable source, by doing so one has the satisfaction of knowing the birds are good and of a strain that has probably taken the breeder years to establish.

It may not perhaps be out of place here to give the characteristics of a laying hen, as the information may be of use to the farmer who may desire to grade up his present stock.

A laying hen is a talker—she cackles a great deal, is always a forager, hunting for food all day, and is an active, nervous bird. She will be noticed to be an early riser and to go late to roost. When selecting from a flock look out for these points.

SHAPE, rangy rather than blocky, deep broad breast, deep abdomen, long neck and body, long broad back, eyes bright and lustrous, comb and wattles brilliant red, shanks well spread, tail fan shaped.

TABLE BREEDS.—Dorking and Indian game are among the best.

CHARACTERISTICS.—The birds should possess large frames; fineness of bone; long deep breasts, white flesh and skin.

CROSS BREEDS.—By careful selection and mating, crossing tends to improve size and general hardiness. To bring about perfection two breeds should be mated whose characteristics and qualities will produce the desired result.

The following crosses can be recommended :—

FOR EGG-PRODUCTION.

Houdan cock	..	...	White Leghorn hens.
" "	...	...	Black Minorca "

FOR UTILITY PURPOSES.

White Leghorn Cock	...	Plymouth Rock Hens
" " "	...	Buff Orpington "
Black Minorca	...	Plymouth Rock "

For Table purposes—

Indian Game Cock	...	Dorking Hens
" " "	...	Favorolle "
" " "	...	Buff Orpington hens

Agricultural Reports.

Reports received from various parts of the country indicate that native crops, though not so plentiful as last year, are yet sufficient to meet requirements, and no shortage of native grain need be anticipated. In several districts the Rapoko or Rukwedza crops suffered severely owing to late rains, but Mabele and maize crops are generally up to the average.

Lions have been reported from several districts, and particularly along the banks of the M'Zingwane River, where at one kraal six cattle and two donkeys were killed in eight days.

Small birds of the finch tribe are stated to be about in greater numbers than usual, and natives with gardens in the vicinity of river beds report serious losses from this cause.

The Native Commissioner's Report for the Charter District draws attention to the increased use of oxen and single furrow ploughs in the cultivation of the native gardens. There seems to be less tendency to trade cattle, and many of the kraals are breaking their young oxen to the plough.

The damage to the tobacco crop, attributable to the late May rains, appears to have been somewhat over-estimated, and though the general quality of the leaf may not be quite so high as last season, individual crops appear for the most part to be satisfactory.

Ground-nuts suffered considerably from the May rains, and much difficulty is being experienced in harvesting the crop owing to the moisture rotting the stalks which attach the nuts to the plant.

The cotton experiments in the Hartley district have for the most part proved unsatisfactory owing to late rains and early frosts. It would appear that the crops were planted rather too late, but the severe cold experienced during June and July was undoubtedly exceptional, and had the season been normal better results would probably have been obtained.

The health of livestock outside the areas of active infection by Coast Fever leaves little to be desired, and though the cold snap will tend to bring about a falling off in condition, the winter veld in most districts will be better than usual. Several reports of losses in sheep from wireworm have been received, but these are inevitable until better methods of flock management are evidenced. Horse sickness has remained rife later in the year than usual, which is somewhat remarkable in view of the low temperature recorded for June and July.

Native labour is scarce in many districts and particularly so in the vicinity of Salisbury, where several farmers are finding much difficulty in getting their maize crops reaped. Several power maize shellers are now at work, and in general reports seem favourable. Considerable knowledge, however, is required in working these machines, and the best results cannot be expected until some experience in setting the drums, etc., has been gained,

Weather Bureau.

TEMPERATURES.

STATION.	MAY.		JUNE.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	73·3	52·3	68·2	43·9
Chishawasha	70·4	51·1	68·5	42·0
Giant Mine	78·2	54·1	72·37	44·5
Hartley ... ..	...	...	71·3	39·2
Inyanga (York Farm)	62·5	46·3	56·9	39·4
Melsetter	64·8	...	...	...
Salisbury Gaol	69·8	49·8	67·3	40·8
„ Laboratory	68·0	49·8	67·1	40·1
Shamva Mine	73·8	54·8	70·9	47·1
Sinoia	73·7	49·0	72·1	38·1
“Summer Field” (Umtali) ... ..	...	...	70·7	40·4
Umtali	74·6	53·9	74·8	55·8
MATABELELAND—				
Bulawayo	70·2	49·0	...	...
Empandeni	72·1	47·0	69·0	39·4
Gwelo	69·7	48·4	65·7	40·1
Hope Fountain	68·9	48·5	...	...
Plumtree	69·8	50·2	...	...
Rhodes Matopo Park	69·3	47·0	63·4	39·3
Tuli	77·6	...	73·6	...
Victoria Falls	78·1	51·0	74·2	42·9

RAINFALL.

STATION.	May	June
MASHONALAND—		
Banket Junction	6·11	...
“Brundret” (Mazoe) ... ..	...	...
Charter (Meikle's Farm) ... ..	...	Nil
Charter (Range)	1·37	0·03
Chicongas Location	3·34	0·09
Chiningo	4·36	0·10
Chishawasha	4·00	Nil
Darwin	7·33	Nil
Driefontein	1·18	Nil
“Eagle's Nest” (Makoni)	4·42	0·04
Eldorado	4·15	...
Gadzema (Giant Mine)	1·64	Nil
Gatooma	0·94	...
Gatooma, Railway Station	0·81	...

RAINFALL—*continued.*

STATION.				May	June
MASHONALAND—(Continued)					
Good Hope (Marandellas)	...	...	...	4.76	Nil
Gormonosi	...	...	...	4.55	...
"Grootfontein" (Umvuma)	...	...	...	1.13	...
Gutu	...	...	...	2.11	0.13
"Halingbury" (Hartley)	...	...	...	1.21	Nil
Hartley, Railway Station	...	...	...	1.22	...
Helvetia (Melsetter)	...	...	...	5.64	1.37
Inyanga	...	...	...	6.97	0.61
Kanyemba	...	...	...	2.40	...
Lone Cow Estate	...	...	...	3.87	Nil
Macheke	...	...	...	6.00	Nil
Makwiro	...	...	...	2.44	...
Marandellas (Railway Station)	...	...	...	7.04	...
Marandellas (Land Settlement Farm)	...	...	...	4.51	...
"Meadows," Salisbury	...	...	...	3.74	...
Melsetter	...	...	...	3.10	...
Monte Cassino	...	...	...	4.45	Nil
Morgenster	...	...	...	3.49	...
Mrewa	...	...	...	3.87	Nil
M'toko	...	...	...	3.02	Nil
Pamshava (N'Danga District)	...	...	...	2.23	...
Rusapi Railway Station	...	...	...	3.80	...
Salisbury	...	...	{ Gaol	4.86	Nil
			{ Laboratory	3.87	Nil
			{ Railway Station	4.58	Nil
Shamva	...	...	...	5.28	...
Sinoia	...	...	...	4.51	0.33
Summerfield Farm	...	...	...	4.38	0.19
"Tom's Hope" (N. Melsetter)	...	...	...	1.81	0.40
Umtali	...	...	...	3.96	0.16
Umtali Railway Station	...	...	...	3.76	...
Umvuma Railway Station	...	...	...	0.36	...
"Utopia," Umtali	...	...	...	4.45	0.42
"Vermont," Melsetter District	...	...	...	5.53	1.49
MATABELELAND—					
Balla Balla	...	...	...	1.64	...
Bembezi	...	...	...	1.40	...
Bulawayo	...	...	{ Observatory	1.34	...
			{ Raylton	1.36	...
Central Farm (Rhodesdale)	...	...	...	1.25	Nil
Empandeni	...	...	...	1.65	Nil
Fig Tree	...	...	...	1.39	0.08
Filabusi	...	...	...	1.35	0.07
Globe & Phoenix Railway Station	...	...	...	0.61	...
Gwaai Railway Station	...	...	...	0.69	Nil
Gwanda Railway Station	...	...	...	Nil	...
Gwelo	...	...	...	1.50	Nil
Gwelo	...	...	{ Railway Station	1.40	Nil
			{ Lower	1.30	...
Heaney Railway Station	...	...	...	1.60	...
Hope Fountain	...	...	...	1.98	...
Insiza Railway Station	...	...	...	2.01	...
Inyati	...	...	...	0.99	...

RAINFALL—*continued.*

STATION.	May.	June.
MATABELELAND—(Continued)		
Malindi	1'92	...
Marula	1'69	Nil
Mangwe Pass	1'42	0'06
"Maxim" Hill	1'39	...
Matopo Mission	1'55	0'04
Matopo Park	1'26	0'05
Mtshabzi Mission	1'69	...
Nyamandhlovu	0'84	...
Plumtree	0'85	...
Rixon	1'15	Nil
Selukwe	3'90	Nil
"Shawlands" (Gwelo)	1'89	...
Solusi	1'35	...
Syringa	1'47	...
Tuli	2'38	Nil
Umguzu ... ..	...	...
Victoria Falls Railway Station	3'80	Nil
Wankie { Hospital...	5'61	Nil
... .. { Railway Station ...	4'70	...
West Nicholson Railway Station	2'15	...

Market Reports.

Messrs. Fear, Colebrook & Co., Ltd., of Southampton, report that the Home markets continue firm and prices show a rise on last few weeks. The following are the quotations by this firm on July 8th :—

Yellow round maize, 24/- to 25/- per 480 lbs. c.i.f.

South African maize, 24/- to 24/6 per 480 lbs. c.i.f., or 8/11½ to 9/2 per bag free on board South African ports.

Red wheats, 32/- to 35/-, white wheats, 33/- to 35/- per 480 lbs. c.i.f.

River Plate oats 15/- to 15/3 per 304 lbs., c.i.f., to the United Kingdom, or equal to 6/3½ to 6/5 per bag, f.o.b. free on board South African ports. South African oats 6/5 to 6/6½ per bag, f.o.b.

The undermentioned firms have kindly supplied prices :— Messrs. Fear, Colebrook & Co., Ltd., Southampton ; Messrs. Jas. Lawrence & Co., Ltd., Kimberley and Johannesburg ; Messrs. Wightman & Co., Ltd., Salisbury.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	11/0 13/6	10/6 12/6	—	—
Beans, per 203 lbs. ...	—	—	—	—
Beans, Sugar ...	20/0 32/6	20/6 30/6	—	—
Beans, kafir, per 203 lbs.	17/0 18/0	16/0 20/0	14/0 15/0	17/0 17/6
Boer Meal, unsifted, per 200 lbs. ...	—	21/6 23/0	—	—
Boer Meal, sifted, per 200 lbs. ...	20/0 25/0	24/0 26/0	42/0 43/0	45/0 47/0
Bran, per 100 lbs. ...	7/6 7/9	6/9 7/3	14/0 14/6	15/6 17/6
Flour ...	—	—	—	—
Flour, Colonial 100 lbs.	—	15/0 16/0	22/0 22/6	20/0 24/6
Forage, T'vaal, 100 lbs.	—	—	—	—
" O.R.C. "	—	—	—	—
" Colonial "	—	4/6 5/6	—	—
" Oat	4/9 5/3	—	12/6 13/0	10/6 12/6
Hay, per ton ...	—	—	60/0 65/0	—
Kaffir Corn, White, per 200 lbs. ...	10/6 11/0	12/6 13/0	8/0 8/6	—
do. Mixed 200 lbs.	10/9 11/3	—	—	—
Manna, per 100 lbs. ...	2/0 3/6	—	—	—

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Mealies, S.A., White per 200 lbs. ...	10/0 10/3	11/0 12/0	11/0 11/6	10/6 10/6
Mealies, S.A., Yellow, per 200 lbs. ...	9/10 10/3	—	10/0 11/0	—
Mealie Meal, White, per 200 lbs. ...	—	11/0 11/6	—	—
Manga, per 200 lbs. ...	—	—	—	10/0 11/0
Monkey Nuts, per lb. ...	—	—	2d. 3d.	2d. 3d.
Oats, per 150 lbs. ...	10/0 11/6	11/0 11/6	20/0 21/6	25/0 27/6
Onions, per 120 lbs. ...	14/0 18/6	20/0 22/6	20/0 21/6	—
Peas, per 200 lbs. ...	—	—	—	—
Potatoes, per 150 lbs. ...	5/6 8/9	4/0 10/0	18/6 19/6	10/6 11/6
„ O.R.C. ...	—	—	—	—
„ New ...	10/0 12/0	10/0 13/0	—	—
Rapoko ...	—	—	—	9/6 10/0
Rye, per 200 lbs. ...	10/6 11/0	—	—	—
Salt, per 200 lbs. ...	—	3/0 4/0	10/6 11/6	—
Tobacco, good, per lb ...	2d. 7d.	4d. 7d.	—	—
„ inferior, per lb ...	—	1d. 2d.	—	—
Wheat, per bag 203 lbs. ...	16/6 20/0	18/6 20/6	—	30/0 31/0
Butter, per lb. ...	1/0 1/2	1/0 1/2	1/6 1/9	2/0 2/6
Butter, second quality ...	8d. 1/0	11d. 10d.	—	—
Eggs, per doz. ...	1/8 2/0	1/0 2/3	1/6 2/3	2/6
Ducks, each ...	1/9 2/6	2/0 3/0	3/0 3/6	4/6
Fowls, each ...	1/0 2/3	1/0 1/6	1/6 2/3	4/6
Geese, each ...	3/3 4/0	—	—	12/6
Turkeys, each ...	4/0 10/6	3/6 9/0	6/6 8/6	£1
Oranges, per 100 ...	—	—	—	—

LIVESTOCK.

Horses ...	£12 £25	£10 £25	£25 £60	£25 £30
„ Mares ...	—	—	—	—
Mules ...	£12 £25	£20 £30	—	£30
Donkeys, geldings ...	£6 £8	£5 £7	£7/10 £10/10	—
„ mares ...	—	£6 £8/10	£9 £10	—
Cows, Dairy ...	—	—	£25 £35	£25 £30
Cows, Native ...	—	—	£7 £9	£10
Heifers, Colonial ...	—	—	£8 £17/10	—
Heifers, Native ...	—	—	—	—
Oxen, Trained ...	—	£7 £8	£8/10 £11/10	£10
Oxen, Ordinary ...	—	—	—	—
Cows, Slaughter ...	£6 £8/10	£7 £8	—	—
Oxen, good ...	£10 £13	£10/10 £13/10	—	—
Oxen, medium ...	—	£8 £9	—	—
Calves, ...	—	£2 £3/10	—	—
Sheep, ...	9/6 17/6	14/0 17/6	16/6 20/0	£1
Lambs, 30 lbs. ...	7/6 10/6	8/0 10/0	—	—
Hamels ...	—	13/0 15/0	—	—
Kapaters ...	—	—	—	—
Pigs, clean, per lb. ...	—	3d. 3½d.	5d. 8d.	4d.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing ; Maize selection and maintenance of the breeding plot ; Points of maize and maize judging, with demonstrations ; Utilisation of granite vlei soils ; Ground nut culture ; Rotation crops for home use and for sale ; Veld improvement by winter grasses ; Production of foodstuffs for the mines ; Ensilage ; Fungoid diseases of maize and wheat ; Wheat, oats, and lucerne under irrigation ; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease ; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught ; feeding and kraaling of live stock ; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility ; The principles of manuring ; the value of lime in agriculture ; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm ; the role of insects and their allies in the transmission of disease ; scale insects and fruit trees and methods for their control ; insect pests and maize ; enemies of the potato, insect and fungus ; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

The below-mentioned seed will be available from October to January next for free distribution in small quantities under the terms of co-operative experiments to any bona-fide farmer in Southern Rhodesia. Seed is supplied f.o.r. Salisbury, on experimenters undertaking to forward a faithful report on the result of the experiments at the close of the season, on forms which will be supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to one applicant.

All applications to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

Leguminous Crops.—Lucerne, Egyptian clover, Soya beans, velvet beans, cowpeas, vetches, and lupines.

Summer Cereals.—Victoria wheat, Durum wheat, Bobs' rust-proof wheat, Gluyas wheat, dryland rice, Boer manna, Japanese millet, and Californian green moha.

Winter Pasture Plants and Grasses.—Sheep's burnet, cocks-foot, tall fescue, awnless brome grass, cowgrass clover,

perennial red clover, sheep's parsley, paspalum, and phalaris bulbosa slips and seed.

Oil and Fibre Crops—Ground-nuts, castor oil, linseed and cotton.

Root Crops.—Mangels, carrots, sugar beet, swedes, kohlrabi, and chicory.

Miscellaneous.—Saltbrush, rape, sunflower, mustard, Teff grass, Rhodes grass, and silvery Ramie.

SEED MAIZE.

The Department is able to offer for sale a limited amount of specially hand-picked seed maize of the below-mentioned kinds, at a price of 15s. per 100 lbs. f.o.r. 19½ mile peg, Lomagundi railway :—

Salisbury white.

Hickory King (8 row).

Hickory King (10 row).

This seed, which will be ready for issue about the end of August, has been grown at the Government Experimental Farm, Gwibi, and has been most carefully selected. Since selection has only been practised for two seasons it is impossible to guarantee that the type is absolutely fixed or will in all cases breed true.

Supplies are limited and applications should be made as early as possible to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury. Orders must in all cases be accompanied by cheque or post office order for the requisite amount. No orders can be reserved until payment has been received, and, to avoid delay in despatch, full address and particulars with regard to forwarding should be given.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each crocodile not less than 3 feet in length	0	10	0
For each baboon	0	2	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this.....day of.....
Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones ; grain, and other produce ; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Fencing Loans Committee, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Committee, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart ; standards not further than 45 feet apart ; droppers or lacing not further than four yards apart ; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Loans Committee to the Director of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country, by R. Mellwaine, M.A., LL.B.

Winter Feeding of Farm Stock, by H. Godfrey Mundy, F.L.S.

Ensilage, by H. Godfrey Mundy, F.L.S.

The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.

Rhodesian Standard Types of Maize and their points, by H. Godfrey Mundy, F.L.S.

Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.

Requirements in sending Botanical Specimens to the Department for Identification.

The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc.

Agricultural Co-operation in Rhodesia, by P. J. Hannon.

Plans and Specifications of Flue Curing Barns.

Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.

Hints on Irrigation—Small Gravitation Schemes—by W. Martin Watt, Government Agricultural Engineer.

Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., Government Agricultural Chemist.

Instruction in Dairying, by Miss E. A. Maidment.

Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.

Winter Cereals, by H. Godfrey Mundy, F.L.S.

CROPS.

How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.

Suggestions for Cotton Growers, by R. H. B. Dickson.

The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.

Maize Growing, by H. Godfrey Mundy, F.L.S.

Onion Growing, by H. Godfrey Mundy, F.L.S.

Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S.

Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.

Flax-Linum Usitatissimum, by C. E. F. Allen.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

Onion Thrips, by R. W. Jack, F.E.S.

"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

The Tsetse Fly, by Lt. E. W. Bevan, M.R.C.V.S.

Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.

The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.

The Head Smut of Maize, by H. Godfrey Mundy, F.E.S.

- Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.
Black Orange Aphis, by Rupert W. Jack, F.E.S.
Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.
Regulations affecting the Importation of Potatoes. by Rupert W. Jack, F.E.S.
Selection of Spraying Outfit, by R. W. Jack, F.E.S.
Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by W. Jack, F.E.S.

VETERINARY.

- Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.
Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S., and M. F. McGregor.
African Coast Fever, by L. E. W. Bevan, M.R.C.V.S.. (revised edition).
Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.
Strangles, by F. D. Ferguson, M.R.C.V.S.
Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.
The Construction of Dipping Tanks for Cattle.
Animals Diseases Consolidation Ordinance, 1904.
Difficult Parturition of the Cow, by C. R. Edmonds, M.R.C.V.S.
Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.
Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.
African Coast Fever—Transport Cattle, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

- Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.
Hints on Brickmaking, by G. S. Dyke.
Loans for Fencing.
Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.
Game Law: Summary of.
Services of Agricultural Engineer.
Lectures for Farmers.
Animals Diseases Amending Ordinance, 1911.
Special Railway Rates for Benefit of Farming Community.

Government Notices.

No. 248 of 1911.]

[20th July, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force in native districts of Gwelo and Selukwe for a period of three months from date hereof.

No. 200 of 1911.]

[8th June, 1911

MOVEMENT OF CATTLE.

UNDER and by virtue of the powers invested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 34 of 1911, and in lieu thereof amend section 16 of Government Notice No. 329 of 1910 by the addition of the following clause:—

" Provided, however, that—

- (a) cattle in transit by rail;
- (b) imported cattle detained at a point within any such declared area for purposes of distribution, either immediately or after inoculation;
- (c) bulls for stud improvement purposes;

may be moved within and from any such declared area under the conditions of sections 5 and 6 hereof, and such other conditions as may be imposed by the Chief Inspector of Stock;

(d) and cattle intended for slaughter purposes may be moved under like conditions from one place in an affected area to another place in the same area, and there slaughtered."

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906," I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

No. 204 of 1911.]

[15th June, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force within an area of 15 miles from Mr. T. C. de Klerk's homestead, on the farm Wonderklip, in the Charter district, for a period of six weeks from publication of this Notice.

No. 215 of 1911.]

[15th June, 1911.]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force over an area within 15 miles of Lallapansi Siding, situated in the Gwelo district, for a period of six weeks from date of this Notice.

No. 218 of 1911.]

[15th June, 1911.]

BLACK QUARTER OR SPONSZIEKTE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the farms Carlsville, Richardson's and Inkuku, in the district of Nyamandhlovu, to be actively infected with the disease known as Black Quarter or Sponziedade, for the purposes of the above Ordinances. Attention is drawn to sub-sections 3 and 4 of section 13 of the first-mentioned Ordinance, which is hereby published for general information.

Section 13 of Ordinance 9 of 1904.

"(3) The carcasses of all animals destroyed under this Ordinance, or that may have died from any destructive disease, shall be forthwith burnt by the owner thereof, at the spot as nearly as may be where the death occurred, or shall be disposed of in accordance with orders given by any official duly authorised thereto by direction of the Administrator.

"(4) Any person disposing of, removing or attempting to remove, any part of an animal destroyed, burnt or buried, under the provisions of this Ordinance, shall be liable upon conviction to a penalty not exceeding Fifty Pounds, or, in default of payment, to imprisonment with or without hard labour for any period not exceeding three months, unless the penalty be sooner paid."

[25th April, 1911.]

PURCHASE OF BULLS BY GOVERNMENT FOR DISTRIBUTION TO FARMERS.

THE Government has arranged to purchase a limited number of Bulls in England, to be re-sold on arrival here to approved applicants in occupation of farms.

The animals are being selected from the Hereford, Sussex and milk Short-horn breeds. They will be about two years of age and old enough for service in October next. The average cost in England is expected to be £40. They will arrive in Salisbury about the end of July next, when they will be placed in charge of the Veterinary Department to tend and test. Approved applicants will be advised when the animals are ready, and will be expected to take immediate delivery.

TERMS.

The purchase price will include all expenses up to the time of delivery, price paid to original owner, commission and charges of buyer and shipper, freight (including attendance and keep on journey), expenses and keep during testing and inoculation up till time of delivery, and a departmental charge to meet administrative expenditure, but not insurance.

No farmer will be allowed to take more than one animal, and one-half of the purchase price must be paid on delivery to applicant, and the balance in six and twelve months, if the animals survive, but either of the latter instalments would be remitted should an animal die before due date. No animal to be disposed of without the written consent of the Director of Agriculture until payment is completed.

All applications should be addressed to the Director of Agriculture, and

should state the breed of animal required and signify agreement to the terms and conditions as stated above.

All applications will be considered in order of priority, but the Government reserves the right to refuse, without stating the reason, the acceptance of any application.

No. 154 of 1911.]

[19th May, 1911]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance of 1904," I do hereby declare the whole of the Native district of Bulawayo to be an area actively infected with the disease known as African Coast Fever.

AFRICAN COAST FEVER.

[25th May, 1911.]

ATENTION is drawn to Government Notice No. 184 of 1911 defining certain areas wherein movement of cattle for draught purposes may be allowed subject to the provisions of Government Notice No. 329 of 1910.

Under Government Notices Nos. 14, 106, and 154 of 1911 certain portions of the country have been declared to be actively infected with African Coast Fever, where all movement of cattle is still prohibited.

The areas mentioned in the subjoined list include portions of infected veld, and no movement of cattle for draught purposes will be permitted within these until further notice.

- No. 4 Figtree Area.
- „ 5 Westacre Area.
- „ 6 Bulawayo Area.
- „ 7 Heaney Junction Area.
- „ 8 Bembesi Area.
- „ 10 Insiza South Area.
- „ 20 Matopo Terminus Area.
- „ 40 16½-Mile Peg Area.
- „ 41 Salisbury A Area.
- „ 42 Salisbury B Area.
- „ 43 Salisbury C Area.
- „ 44 Salisbury D Area.
- „ 47 Marandellas North Area.
- „ 48 Marandellas South Area.
- „ 50 Headlands Area.
- „ 51 Junction Mazoe & Lomagundi Railway Area.
- „ 52 23-Mile Peg Lomagundi Railway Area.
- „ 53 Passaford Area.

F. J. CLARKE,
For the Director of Agriculture.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in Gwelo native district, as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I. of the Fencing Ordinance of 1904 to the undermentioned area:—

From the Shangani River on the Bulawayo-Salisbury road, along this road to its intersection with the Gwelo commonage boundary; thence following

the south-western, south-eastern and eastern boundaries of the commonage till the Bulawayo-Salisbury road is again reached; thence along this road to its intersection with the south-western boundary of the Central Estates; thence in a north-westerly direction along the south-western boundary to the most western beacon of the said estates; thence along the north-western boundary of the estates to where it crosses the Sebakwe River; thence along this river to Hartley Hill road; thence along this road to the Umniati River; thence along this river to its junction with the Ngadoni River; thence along a line drawn to the north-east corner of the Shangani Native Reserve; thence along the eastern boundary of this reserve to where it is crossed by the Shangani River; thence along this river to the Shangani Drift on the Bulawayo-Salisbury road.

Dated at Gwelo, this 4th day of April, 1911.

For self and co-petitioners,

H. R. CUMMING.

No. 85 of 1911.]

[16th March, 1911.

IT is hereby notified for public information that the subjoined Ordinances entitled

“Additional Appropriation 1910-11 Ordinance, 1911,”

“Animals Diseases Amendment Ordinance, 1911,” have been assented to by His Excellency the High Commissioner, and are hereby published in terms of the 36th section of the Southern Rhodesia Order in Council, 1898.”

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the “Animals Diseases Consolidated Ordinance, 1904” (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.
- (2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.
- (3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.
- (4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which

it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

- (5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10; or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

(2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section II, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:

"Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out."

19. Section 22, sub-section (I) of the said Ordinance is hereby amended by the addition of the following words after the word "obtained" in the twelfth line of the said sub-section, "and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained."

20. This Ordinance may be cited as the "Animals Diseases Amending Ordinance, 1911," and shall be read as one with the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amendment Ordinance, 1910."

No. 295 of 1908.]

[1st October, 1908.]

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingwilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melssetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christ-mas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about $2\frac{1}{2}$ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly

known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on.....
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

.....
Resident Magistrate, Government Veteri-
nary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals..... Pigs, Sheep,
..... Goats.

Place from which animals are to be sent.....

Owner's Name and Address

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—
- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (i.e., station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent
.....

And I make this solemn declaration conscientiously believing the same to be true.
.....

Declared to at.....on this.....
day of.....before me,

Resident Magistrate for the district of
.....

No. 60 of 1911.]

[23rd February, 1911.

IMPORTATION OF SHEEP AND GOATS FROM THE CAPE OF GOOD HOPE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section I of the Regulations published under Government Notice No. 295 of 1908 by the insertion of the words "or Examiner of Stock" immediately after the word "officer" where it occurs in the said section.

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck and Wildebeest.

- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the landowner.

No. 391 of 1908]

[17th December, 1908]

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next

in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909]

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-

rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£ s. d.		
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance	0	10	6
plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;			
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls " 	0	5	0
d. " donkeys " 	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive

in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section I subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue

of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
- [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.
- Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
 5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
 6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....

Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,

.....Calves,

.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....

Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mahfen	Kilmuir
Guernsey	Gilnochie	Gravelley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- the districts from which they come and through which they pass are free from contagious diseases of animals;
- the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to

import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
.....calves,
.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
.....calves,
.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 229 of 1910]

AFRICAN COAST FEVER.

[17th August, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

IMPORTATION OF ANIMALS.

[18th August, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
British Burmah
Assam
China and bordering countries, including Korea
French Indo-China
Dutch East Indies
Hong Kong
Federal Malay States
The Philippines
Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramaquabane Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-MacLoutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
The Oleander Scale (*C. hederac*)
The Circular Purple Scale (*C. aonidum*)
Ross's Black Scale (*C. rossi*)
The Purple or Mussel Scale (*Lepidosaphes beckii*)
The Long Scale (*L. gloveri*)
The White Peach Scale (*Aulacaspis pentagona*)
Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 329 of 1910.]

[15th December, 1910.

AFRICAN COAST FEVER.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

I. Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw

Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof.

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;
- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9. From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farm jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railways line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle—

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....
Bulls.....
Oxen.....
Young Stock.....
Calves.....
Cause of decrease.....
Cause of increase.....
Name of farm.....

(Owner's Signature.)

[2nd February, 1911.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in accordance with section 16 of Government Notice No. 329 of 1910, declare the following areas to be actively infected with the disease known as African Coast Fever:—

Farm Hayden, Goromonzi district.
Farm Tilbury, Melsetter district.
Farm Aberfoyle, } Selukwe district.
Farm Brooklands, }
Farm Riversdale. }

[23rd February, 1911.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in accordance with section 16 of the Regulations published under Government Notice No. 329 of 1910, I do hereby declare the whole of the native district of Matobo to be an area actively infected with the disease known as African Coast Fever.

[7th February, 1911.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 16 of Government Notice No. 329 of 1910, by the addition of the following clause :

“Provided, however, that cattle intended for slaughter purposes may be removed to a centre of consumption under the conditions of section 6 hereof, and under such other conditions as may be prescribed by the Chief Inspector of Stock.”

[12th January, 1911.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 168, 281 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

1. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

- (d) The native district of Inyanga.
- (e) The native district of Makoni.
- (f) The native district of Umzingwani.
- (g) The following farms in the native district of Insiza :—

Centrebank,	York,	Kildare,	Lincoln,
Woodhouse,	Kogha,	Eldorado,	Bonnybrook,
Fairview,	Outspan No. 3,	Lancaster,	Blagdon,
Idutwa.			

2. The following area is defined for the purposes of section 17 of the said Notice, viz. :—That portion of the native district of Goromonzi lying west of and including the following farms :—

Borrowdale, Springs, Stuhm, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruua River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information :—

"16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage; hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

"17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every pers on within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule "A" being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following :—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imbeza Plots.

Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

Veterinary Report for May and June, 1911.

The reports appearing in the June number should have been headed March and April. The printing error is regretted.

SALISBURY.

AFRICAN COAST FEVER.—No cases of disease have occurred. Several of the areas will be tested and, if found to be clean, the quarantine will be removed.

One suspicious case occurred at Good Hope. The cattle were placed under observation, but the presence of disease was not detected.

INYANGA DISTRICT.

AFRICAN COAST FEVER.—European herds may now be considered to be cleansed of infection. Ten native herds have been freed of the disease, but two remain infected; the disease in them now shows signs of abatement.

MAKONI.

AFRICAN COAST FEVER.—Four European-owned herds remain healthy after passing through the temperature camps. The cattle left on Timaru as suspicious are gradually being destroyed on rise of temperature. The seventeen head removed from Timaru and placed on Wick are doing well and remain without temperatures.

Two of the native herds have been released from further operations and two remain under treatment.

The herd which ran back to infected veld has fortunately shewn no recrudescence of the disease after their return to clean veld. Extended operations have been undertaken right through the Makoni and Manica Reserves, and for fifteen miles on either side of the infected roads; for the most part herds which became infected were right on the site of old

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